

OCT 29 1945

# Accounting Review

**Art or Science**

MAURICE E. PELOUBET

**Accounting and Statistics**

ROBERT K. MAUTZ

**Case History of a Terminated Contract**

ROBERT G. ALLYN

**Income Taxes and Capital Investment**

L. B. MCINTIRE

**Economic and Accounting Concepts**

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**Accounting for the Dairy Products Industry**

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**Original Cost as a Rate Base**

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**Testing Obsolescence in Fixed Assets**

OSCAR S. NELSON

**Studying Auditing Procedure**

WALTER A. FOY

OCTOBER

1945

THE AMERICAN INSTITUTE OF ACCOUNTANTS  
ANNOUNCES THE PUBLICATION OF

## *Contemporary Accounting*

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# The Accounting Review

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## ART OR SCIENCE

MAURICE E. PELOUBET

IN THE PREPARATION of accounting statements there are, broadly speaking, two phases of the work: first, the compiling and assembling of the underlying facts and data and, second, the form and method of presentation. One reason why many accounting statements are not easily produced or satisfactory when completed is that the underlying accounts and records are not designed with an eye to the final statement. There are naturally many purposes for which records are used besides the preparation of statements and exhibits, and full weight must be given to these purposes. It is generally possible, however, to arrange underlying records so that both purposes may be served.

For instance, the prime purpose of a record of sales is to provide a medium for recording the day's transactions as they occur and to make certain that each customer is correctly charged with what is sold to him. Many other purposes may be served by such a record, none of which may be directly connected with its primary purpose, but which, on the other hand, will not obscure or hinder it. It is likely that the sales manager will need a distribution, say by products and by geographical divisions. He may also need a distribution by salesmen or sales offices. Some of the sales may carry a sales tax and others may not. If the company is itself a subsidiary or an affiliate of another company or if it controls subsidiaries of its own, sales to consolidated and non-

consolidated affiliates and subsidiaries will need to be known in order to prepare consolidated accounts.

Another purpose of the sales record is, of course, to provide correct total figures for controlling accounts.

If these purposes are all borne in mind at the time the system is designed, provision for obtaining this information may be made with very little additional expense or difficulty over that required for the original entry. If the volume of business is large enough to permit the use of a punch card system, the card can be arranged so that this and a great deal more information can be obtained merely by running the cards through the machine. It would, however, be impossible to do this unless what might be called the subsidiary purposes of the record were understood and provided for at the same time as the primary purpose. If the concern were smaller and a billing machine were used, the invoice could be so arranged that the analysis required could be made at the same time as the invoice was prepared. This simple example serves to illustrate what has always seemed to me a basic principle in both system design and the use and interpretation of accounting data: the importance of knowing at the time the first entry is made exactly how the information will be used and for what purposes through all subsidiary reports and records up to the final condensed statements for executives or for the public.

Obviously not every clerk concerned with the records can know the ultimate purpose of the information he is recording, but I believe that unless conditions make it entirely impossible no accounting work should be done except under the supervision of someone who understands the final use and destination of the figures being prepared by those working immediately under him. Any one who has tried to compare or consolidate the accounts of a number of independent companies in the same line of business knows how difficult it is to prepare clear and informative statements if the basic data have been recorded under half a dozen different systems and theories.

The first problem of the man responsible for coordinating the accounts is to determine on his own system and to make the best rough revision he can of the other accounts to agree with that. I think anyone in public practice will agree that such a revision is very rough. This part of the work, although extremely important, is mechanical to a certain extent, and has been covered in detail in numbers of books and articles. I do not wish to go into a discussion of accounting systems any further than is necessary to show their relation to the final statements. If we assume that we have our basic data properly arranged and classified the rest of the problem is one of presentation and personalities or, to put it another way, it is synthetic and psychological whereas the first division of our problem is analytical and mechanical. We all know, particularly accountants in private employment, that accounting is not an end in itself. This is expressed forcibly and somewhat unfairly by a great many practical men who sum it all up by saying that "Bookkeeping is a dead expense." While this is exaggerated, it is still true that accounting is always a means and never an end. The most carefully prepared and most comprehensive

accounting statement that can be conceived of would be entirely useless unless it were read and understood and a correct impression received from it.

Another closely related point is that most accounting statements are prepared for those who are not accountants and who have had little or no accounting training. This will probably always be true, as the type of man who is a successful sales or operating executive is generally not temperamentally fitted to understand the methods, processes, or theories of accounting. Such a man, however, often shows a surprising ability to grasp and utilize the results of accounting work. It is for this reason that accounting statements prepared in technical accounting form generally either fail in their effect completely or are not so well understood or effective as they should be.

When an author writes a novel he is greatly concerned about its literary form. He plans his plot carefully, he makes an effort to develop his characters logically and naturally, he accumulates a vast amount of material about the period or country in which the scene of his book is laid, and goes through much more labor of the same sort before his book is finished. The average reader not only has no interest in the literary form, the technique of character development, or the amount of research which the author has done, but usually does not even realize that there is any necessity for this sort of work and is quite unconscious of the laborious process necessary to produce what seems to be a bright, spontaneous, quickly moving story.

It is much the same when an executive receives a brief statement from his accountant showing the history of a business for a month or a year or the progress of a certain division of his business. The executive, if the statement is well prepared, sees immediately what has happened. He has little conception of the vast

amount of detail behind the figures, of the thought required for their proper presentation, or of the amount of confusion which could be caused by an incorrect presentation or arrangement of facts correct in themselves.

This places a heavy responsibility on the man charged with the preparation of the statement or report. Even if it were desirable, it is impossible to present accounting statements which are reflections of absolute fact or truth. Judgment or opinion is involved in the preparation or use of even the most simple statement and an impression of some sort is made by every statement. A simple list of accounts receivable implies that the accounts listed are good and collectible. If this is not true in the opinion of whoever prepares the list, then a false impression is created by the presentation of facts which may be technically correct.

We all know that statements and accounts should not be prepared to justify a particular course of conduct or to shield a particular official, although it is quite possible for a skillful manipulator to do this and still remain within the limits of technical correctness. The point really is that accounting statements, in their own humble way, are works of art, that is, they are the expression of a process by which many details are mastered, grouped, analyzed, and selected to present the picture or to make the impression which the man who is preparing the statement believes to be the true one.

Accounting is a method of description which chooses, as all methods of description must, a particular aspect of a complex and complicated phenomenon. The aspect chosen is the financial one, and other aspects are described by other arts. The representation of a given aspect of any phenomenon by a descriptive art requires selection, condensation, and arrangement in order to make it intelligible.

All this presupposes a picture in the mind of the narrator or describer which, in his opinion, is as near the truth as possible and which he believes will be suited to the comprehension of the reader and intelligible to him.

Much of the effort of modern accounting has been directed toward rapid and accurate classification and compilation. There is no science in this. It is merely the grouping of like items of description, and the determination of whether these items are alike or different is a matter of opinion. If we are sorting out a number of mineral specimens, there are definite objective tests—color, form of crystal, chemical composition, and other characteristics—which determine exactly what a particular mineral is; thus the classification is not a matter of opinion, but rests on the basis of scientific fact. For a series of expenditures, however, there are no such tests. We fall back ultimately on the purpose and intention of the management under which the expenditures were made.

A purchase of tool steel may ultimately be shown in any one of a dozen accounts, depending on whether the tool made from it was for current production purposes or for a special order, as part of a construction job or as part of a repair job. In every case the distribution to an account is based on a human purpose or intention rather than on a scientific fact which may be objectively ascertained.

The form of presentation of a balance sheet is generally conceded to be a matter of opinion, but I am not so sure that the influence of opinion or purpose or intention in almost every business expenditure is so well recognized. A little thought and analysis applied to actual transactions and accounting records will, however, demonstrate the truth of this.

We are often told by critics of the profession that accounting is not a science. This is not stated as an objective fact, but



rather presented as an accusation. The assumption is that accounting ought to be a science, and that it is merely the mental indolence, ineptness, and lack of real ability among the practitioners of accountancy that prevent it from being a full-fledged science.

I am in complete agreement with the statement that accounting is not a science, but I do not believe that we should regard this as an accusation any more than would a musician or painter the assertion that his work was not of a scientific nature. Every art makes use of and depends on a number of sciences. Music, for instance, requires the co-operation of mathematics and physics, principally, to produce its effects, but it also draws on most of the other sciences connected with mechanics. Painting is dependent, principally, on that part of physics which has to do with optical phenomena and on chemistry, although it also calls in the aid of many of the sciences which assist in mechanical processes.

The fact that these two methods of expression require the assistance of the sciences does not make them sciences in themselves any more than the fact that accountancy makes use of certain mathematical principles, mechanical devices, or methods of scientific analysis and synthesis makes it a science.

If accounting had to do with phenomena that could be objectively and accurately measured, such as the motion of the planets or the behavior of gases under given conditions of pressure and temperature, calculations based on accounting data could be made which would result in accurate predictions, but accounting data are not of this nature. They are the expression of human purpose, will, or intention, and so far it has been impossible to reduce these human elements to any rules which may be universally and objectively applied. It is not easy even to describe in the accounts of an enterprise what has hap-

pened in the past. So far, no basis for accurate prediction has been discovered. The whole question revolves around the distinction between an art and a science. A science must rest on facts subject to exact measurement and objectively observed. An art may make use of the same facts as the science, but an art is essentially a description or representation of the purposes and effects of human actions and emotions influenced, consciously or unconsciously, by the opinions and personality of the artist.

One of the usual tests for a science is the ability to calculate, with some accuracy, at the present time, what will happen in the future. Accountants have consistently opposed any tendencies to regard themselves as qualified to predict or to prophesy. Accounting statements present an appearance of exactness and precision which often causes those who have to do only with the statements produced from accounting data to ascribe to such statements an exactness and finality which anyone who has had experience in their compilation from the basic records to the final statements knows does not exist. The usefulness of accounting statements and their value in the conduct of modern business and finance have often been described and are generally admitted. It is equally important both for accountants and for businessmen to recognize their limitations.

All this simply means that when we prepare accounting statements we must realize that, whether we like it or not, they constitute a picture of something which we have formed in our own minds and for which we must accept the responsibility. This does not mean that every clerk, or subordinate in an accounting organization is required to form his own opinion of the adequacy and character of every accounting statement he makes. It is quite possible for the function of selection and arrange-



ment to be exercised but once: that is, if instructions are issued to classify a certain item in a certain way, the continued classification of that item in that manner is somewhat similar to the striking of coins from a die. The artist designs and cuts the die, but the man who runs the machine is responsible merely for producing correct copies. As an example, the balance sheet of a manufacturing company may be drawn up in four different ways, depending on the points which it is intended to bring out. These balance sheets are all drawn up from the same trial balance and the same basic information. A single statement bringing out all the points on these balance sheets would be unwieldy in form and size and would contain so many figures that any one aspect of the business would be quite obscured.

Balance Sheet "A" is a condensed balance sheet which, together with a proper certificate and income account, would give a stockholder what he would need to know about the company. The current position is clearly shown and the items are summarized in such a way that the general financial position of the company can be seen at a glance.

Balance Sheet "B" is prepared for a bank or a credit grantor. The current assets are the principal item of interest here. Whereas the stockholder needs only to know that the net amount of the accounts receivable on the balance sheet is good and collectible, the credit grantor generally wishes to know the age of the accounts and the amount of the reserve. The credit grantor is also interested in the composition and method of valuation of the inventory and usually wishes more detail than is necessary for the stockholder. The emphasis is placed on receivables and inventories, because the credit grantor is what might be called a very short-term investor in the business. He expects to get his money out in some

comparatively short period—three, six, or nine months—and he is interested primarily in what the business will do in that time. His point of view is very different from that of the long-term investor or stockholder who is interested in the enterprise as a going concern. The credit grantor wishes to know his possibility of collection both on a liquidation basis and on the basis of a continuing, going concern. The stockholder does not have the same interest in accounts on a liquidation basis, because he is the last party to be considered on liquidation whereas the credit grantor is one of the first.

Balance Sheet "C" is an interesting and valuable type of statement. Opinion and judgment enter very largely into its composition, as the point to be brought out here is the amount of cash or current assets which can be currently liquidated, will not need to be replaced, and can safely be disbursed to stockholders or used for reinvestment, say, in fixed assets. The first step in the preparation of such a statement is to determine the average requirement of cash and inventories for the enterprise. The next step is to determine which assets, if any, may be disposed of without affecting the conduct of the enterprise. The current assets can then be divided on this basis between those required in the business and those not required in the business, and the directors and executives will be able to decide on a safe and reasonable dividend policy. This statement might also be used to rebut an allegation that surplus as contemplated under Section 102 of the various Revenue acts was being improperly accumulated.

Balance Sheet "D" is entirely different from the other three. The hypothetical company under consideration has, it is assumed, three plants, A and B of approximately the same capacity and size, and C of about half the size of A or B.

Certain other assets, such as Accounts Receivable, Accounts Payable, and the greater part of the cash, are kept on the books of the head office. However, the head office exists only for the purpose of operating the enterprise through the individual plants and the head office is, therefore, not shown as a separate division in this statement, its assets being prorated on various reasonable bases back to the operating plants. Such a statement is of great value in judging the efficiency of the various individual plants as it, in effect, places each one in the position of a separate operating company. It is not a difficult statement to prepare and is quite reliable, provided the basis of any necessary prorations is shown. It is generally better to prorate all assets and liabilities for the company back to its operating units than to have a sort of miscellaneous column for items such as marketable securities, or special accounts receivable or payable, which are not applied to any particular plant. If these items have no relation to the operation of the business they should not be on the books, and if they are on the books they are presumably the result of some transaction engaged in for the benefit of the business as a whole. Each plant, therefore, should carry its proportionate part of such a liability or the proportionate part of the assets should be included in the investment.

The four types of balance sheet shown are merely illustrations. The only limit to the number of different types of useful statements which can be prepared from the same trial balance is the number of

purposes the statements are to serve or the requirements which are to be met. We must prepare statements for purposes of taxation, price adjustment, or renegotiation, for submission to regulatory authorities, for use in labor negotiations, and for many other purposes, all of which require correct but different types of statement. The possible variations are many and there would be no great value in attempting to describe large numbers of these. That is the province of special instruction books or special articles. The purpose here is to bring out two points: first, that practically every accounting statement is a "special purpose statement"; and, second, that there is nothing suspicious or discreditable in the circumstance that no one absolutely correct "all-purpose statement" can be prepared.

Generally speaking, in preparing a statement we must first know the points to be brought out and the purpose for which it is to be used. We should then have some knowledge of the men or man who will be required to read the statements. In other words, a statement must first be correct and next intelligible. On the whole, the first requirement is fulfilled more often than the second, but if a statement is not intelligible no amount of technical correctness will prevent it from being practically useless. Statements always give some sort of impression even if that impression is only one of incomprehensibility and confusion. It is for the accountant to decide what impression his statement will make and to prepare it with that in mind.

**Important announcement inside back cover.**

A

THE METAL PRODUCTS COMPANY  
Balance Sheet (for stockholders)

<b>Assets:</b>			
<b>Current:</b>			
Cash.....	\$	796,498.00	
Marketable Securities (Value at current quotations, \$103,275.00).....		113,250.00	
Accounts Receivable—Trade, less reserve.....		451,530.00	
Raw Materials and Manufactured Products—at cost.....		568,500.00	
Supplies—at cost.....		50,290.00	
Accounts Receivable—Officers and Directors.....		17,500.00	1,997,568.00
<b>Deferred Charges:</b>			
Prepaid Expenses.....			26,585.00
<b>Fixed:</b>			
Land.....		350,230.00	
Buildings, Machinery and Equipment—at cost.....	\$4,060,895.00		
Less: Reserve for Depreciation.....	1,656,960.00	2,403,935.00	
Patents.....		10.00	2,754,175.00
			<u>\$4,778,328.00</u>
<b>Liabilities:</b>			
<b>Current:</b>			
Accounts Payable—Trade.....	\$	557,507.00	
Salaries and Wages payable.....		45,881.00	
Accrued liabilities.....		96,041.00	699,429.00
Reserve for Contingencies.....			50,000.00
Capital Stock—25,000 shares of \$100.00 par value each.....			2,500,000.00
Surplus.....			1,528,899.00
			<u>\$4,778,328.00</u>

B

Statement for Bank or Credit-Grantor

<b>Assets:</b>			
<b>Current:</b>			
Cash.....	\$	796,498.00	
Marketable Securities (Value at current quotations, \$103,275.00).....		113,250.00	
Accounts Receivable:			
90 days and over.....	\$	16,900.00	
60 to 90 days.....		22,270.00	
30 to 60 days.....		420,500.00	
Less than 30 days.....		26,910.00	
		486,530.00	
Less: Reserve.....		35,000.00	451,530.00
<b>Inventories:</b>			
Raw Materials—at cost which is lower than market....	160,650.00		
Goods in Process—at cost.....	232,600.00		
Finished Goods—at cost which is lower than sales price less selling expenses.....	175,250.00	568,500.00	
Supplies—at cost.....		50,290.00	
Accounts Receivable—Officers and Directors.....		17,500.00	1,997,568.00
<b>Deferred Charges:</b>			
Prepaid Expenses.....			26,585.00
<b>Fixed:</b>			
Land.....		350,230.00	
Buildings, Machinery and Equipment—at cost.....	4,060,895.00		
Less: Reserve for Depreciation.....	1,656,960.00	2,403,935.00	
Patents.....		10.00	2,754,175.00
			<u>\$4,778,328.00</u>

**Liabilities:****Current:**

Accounts Payable—trade.....	\$ 557,507.00	
Salaries and Wages payable.....	45,881.00	
Accrued liabilities.....	96,041.00	699,429.00
Reserve for Contingencies.....		50,000.00
Capital Stock—25,000 shares of \$100.00 par value each.....		2,500,000.00
Surplus.....		1,528,899.00
		<u>\$4,778,328.00</u>

**Statement for Directors—Amount Available for Dividends****Assets:**

Fixed Assets—Net.....		\$2,754,175.00
Deferred Charges.....		26,585.00
Current Assets:		
Required in business:		
Cash—Two months' requirements for purchases and payroll.....	\$500,000.00	
Accounts Receivable (Actual—about 30 days' business).....	451,530.00	
Raw Materials and Manufactured Products (No important excess over requirements).....	568,500.00	
Supplies.....	50,290.00	1,570,320.00
Not required in business—available for distribution:		
Excess cash.....	296,498.00	
Marketable Securities—Market Value.....	103,275.00	
Accounts Receivable—Officers and directors—immediately collectible.....	5,000.00	404,773.00
Excess of cost over market of marketable securities.....	9,975.00	
Accounts of officers and directors collectible within one year but not immediately.....	12,500.00	22,475.00
		<u>\$4,778,328.00</u>

**Liabilities:**

Current Liabilities.....	\$ 699,429.00
Reserve for Contingencies.....	50,000.00
Capital Stock.....	2,500,000.00
Surplus.....	1,528,899.00
	<u>\$4,778,328.00</u>

**Balance Sheet Showing Investment Attributable to Each Plant**

	Plant A	Plant B	Plant C	Total
<b>Assets:</b>				
<b>Fixed:</b>				
Land.....	\$ 150,000	\$ 150,000	\$ 50,230	\$ 350,230
Buildings.....	425,150	375,700	155,700	956,550
Machinery and Equipment.....	1,321,000	1,100,570	615,745	3,037,315
Furniture and Fixtures.....	21,000	25,000	17,490	63,490
Automobiles and Trucks.....	1,400	1,300	840	3,540
Patents.....	10			10
	<u>\$1,918,560</u>	<u>\$1,652,570</u>	<u>\$ 840,005</u>	<u>\$4,411,135</u>
Less Reserve for Depreciation.....	721,830	703,620	231,510	1,656,960
	<u>\$1,196,730</u>	<u>\$ 948,950</u>	<u>\$ 608,495</u>	<u>\$2,754,175</u>
<b>Current:</b>				
Cash (A).....	\$ 318,600	\$ 318,600	\$ 159,298	\$ 796,498
Marketable Securities (A).....	45,300	45,300	22,650	113,250
Accounts Receivable—Trade less reserve (B).....	194,158	171,581	85,791	451,530
Raw Materials.....	71,710	68,430	20,510	160,650
Goods in Process.....	95,430	90,760	46,410	232,600
Finished Goods.....	71,110	72,030	32,110	175,250
Supplies.....	21,040	20,220	9,030	50,290
Accounts Receivable—Officers and Directors (A).....	7,000	7,000	3,500	17,500
	<u>\$ 824,348</u>	<u>793,921</u>	<u>379,299</u>	<u>1,997,568</u>

Deferred Charges:				
Prepaid Expenses.....	\$ 12,231	\$ 8,143	\$ 6,211	\$ 26,585
Total Assets.....	<u>\$2,033,309</u>	<u>\$1,751,014</u>	<u>\$ 994,005</u>	<u>\$4,778,328</u>
Liabilities:				
Current:				
Accounts Payable—Trade (A).....	\$ 223,003	\$ 223,003	\$ 111,501	\$ 557,507
Salaries and Wages Payable (A).....	18,352	18,352	9,177	45,881
Accrued Liabilities (A).....	38,416	38,416	19,209	96,041
	<u>\$ 279,771</u>	<u>\$ 279,771</u>	<u>\$ 139,887</u>	<u>\$ 699,429</u>
Reserve for Contingencies.....	\$ 20,000	\$ 20,000	\$ 10,000	\$ 50,000
Total Liabilities.....	<u>\$ 299,771</u>	<u>\$ 299,771</u>	<u>\$ 149,887</u>	<u>\$ 749,429</u>
Net Investment—Capital Stock and Surplus.....	<u>\$1,733,538</u>	<u>\$1,451,243</u>	<u>\$ 844,118</u>	<u>\$4,028,899</u>
Profit for year.....	<u>\$ 157,200</u>	<u>\$ 116,100</u>	<u>\$ 51,950</u>	<u>\$ 325,250</u>
Per cent return on investment.....	9.0682	8.0000	6.1544	8.0729
A—Prorated on basis of total payroll and purchases.				
B—Prorated on basis of sales.				

## ACCOUNTING AND STATISTICS

ROBERT K. MAUTZ

"Accounting and statistics are similar in their use, for both are tools of control. They are also similar in their method, bearing, so to speak, a family resemblance, for accounting and statistics may be regarded as offspring of the single parent, quantitative method of analysis."<sup>1</sup>

A CORRESPONDENCE of nature and method that is as marked as Mr. Rorem indicates warrants further analysis. First, a comparison of the two fields should lead to a better understanding of the accounting problems of dealing with masses of data; second, a comparison of statistical tables with financial statements should point out the existence of any special problems involved in the presentation of accounting information through financial statements; third, from a study of statistics and the rules therein formulated for the treatment of masses of numerical data it may be possible to derive some ideas applicable to the preparation and presentation of information in financial statements.

Accounting and statistics are much alike. Both are methods for the collection, classification, summarization, and presentation of numerical data. Each has as its goal the presentation of information in such a way that the information is clear and usable. Neither seeks to direct any action. Rather the intention in both fields is to analyze and classify the information and to indicate interrelationships within the material clearly and completely so that one who studies the reported data can readily determine what action should properly be taken. Accounting and statistics do not recommend action; they are merely service mechanisms to provide information that can be useful in the making of decisions which do lead to action.

If "interpret" is given a broad meaning, both accounting and statistics are "interpretive" in intention. They work upon

<sup>1</sup> Rorem, C. R., "Similarities of Accounting and Statistical Method," ACCOUNTING REVIEW, March, 1927, p. 10.



masses of undigested data and translate them into concise summaries; by arranging facts they reveal the meaning of technical data; through illustrative representations they convey the significance of the data to the reader's mind. Interpretation can be objective, that is, explanatory of facts, or it can be subjective, construing facts in the light of individual belief or judgment. Only interpretation in the objective sense is appropriate for accounting and statistics. Their function is like that of a translator—to convert the facts for one who cannot understand the significance of those facts unless they are presented in more familiar language. Neither accounting nor statistics should distort facts or impart to them a subjective, individualistic meaning.

Thus accounting and statistics are similar in function as well as in nature. Each is concerned with the collection and presentation of information for interested parties. This is more readily apparent if the application of statistics to business is compared with accounting. Business statistics and accounting are both concerned with obtaining and making available for use the facts about the operations and status of an enterprise so that those who are responsible for control of the enterprise can have the information they need to aid in the proper discharge of their responsibility for control.<sup>2</sup>

But statistics and accounting have dissimilarities also. Chief among them is a difference in applicability. Statistics has been found serviceable as a device for gathering and interpreting facts in many different fields of study: chemistry, physics, biology, sociology, economics, and others. Accounting has no such wide applicability. It was originated to serve the business enterprise and has been found serviceable in very few other situations.

<sup>2</sup> Stockton, John R., *An Introduction to Business Statistics* (Boston, 1938), p. 3.

The peculiar methodology of double entry, which is so well suited to the analysis and interpretation of financial data in enterprise transactions, is not flexible enough to serve many other fields. Almost the only utilization of accounting outside the field of private business enterprise has been its application to the financial activities of governmental units. And its application here is based upon viewing such governmental activities as if they constitute a specialized form of business enterprise.

Another dissimilarity grows out of this difference. Because of its wide applicability statistics must be able to use a variety of measuring units, either simple or complex, such as an individual, a cubic centimeter, a death, a ton-mile, a North-European immigrant, and many others. Different units of measure are required for each of the several fields which statistics serves and often for different studies within the same field. A variety of measuring units is not found in accounting; only one is used, a unit of money-price—in this country expressed in dollars. Accounting is limited to the recording of phenomena which are expressed in monetary terms as exchange prices. Even if the methodology employed by accounting were made applicable to other fields, the lack of appropriate measuring units would definitely limit its usefulness.

A third difference between accounting and statistics is found in the significance of data in each field. In statistics, the data consist of single units, each of which is an addition to some class. The units may be classified in various ways but in every case any given unit has but one aspect: it is an addition to one group only. In accounting, the basic data take the form of transactions, each of which has at least a twofold aspect. The unquestioned fact that all accountable property is claimed by someone gives rise to the equation: Assets=



**Liabilities+Proprietorship.** Viewed in the light of this equation, every transaction must be recognized as having at least a twofold effect. If it increases one member of the equation, it must either also increase the other member or decrease some element in the first member in order to keep the equation in balance. Likewise, if a transaction causes a decrease in one member, that decrease must be countered by an increase in the same member or a decrease in the other member of the equation. This means that each transaction gives rise to at least two items of equal accounting significance, each of which must be recorded. Thus accounting data are multiple, not singular, in effect, and may express either plus or minus; statistical data are only singular in effect and always express additions. This difference in the significance of accounting data as compared with statistical data affects the methodology for handling accounting data and, to some extent, the method of presenting the summarized information.

Bookkeeping can be described as a continuous statistical investigation of a business concern, a description which emphasizes the similarities between bookkeeping method and statistical procedure. In both cases the procedure involves three steps: collection, classification, and summary. And there is a distinct similarity in the way in which accounting and statistics execute each step; yet there are important differences as well.

One difference is found in the collection procedure. Statistics sometimes makes use of the technique of sampling; bookkeeping definitely avoids this method. Sampling consists of selecting a portion as indicative of the whole. It is a device based upon the law of large numbers and is used where a reliable indication of trend or tendency rather than an absolute total is desired. Well-known applications of this technique are the currently popular public

opinion polls. A cross section of the population of a region, state, or nation is selected as the sample. The combined views of the individuals included in this cross-section sample are then taken as indicating the view or attitude of the whole population represented by the sample. The accuracy of the device depends directly upon the skill with which the sample is selected. The sample must include, proportionally, all classes of the population.

Sampling does find a place in auditing. Auditors commonly resort to test-checks of the mass of data and verify sample groups of transactions when performing a balance-sheet audit. But in bookkeeping there is no place for sampling; exact totals rather than tendencies are desired. A sample booking of the daily transactions might indicate that cash receipts exceed disbursements; but that would not be enough. The total received and the total disbursed must be ascertained so that the amount that should be on hand can be determined for use as a basis for making decisions as to current conditions, need for additional funds, etc. Likewise, actual figures for total sales, expenses, costs, etc. are needed if periodic profit is to be properly computed.

The different significance of data in statistics and in accounting was pointed out above. That difference gives rise to differences in the procedures of classification and summarization. In statistics each unit is an addition to a given class; the intention is to discover the total number of items having certain characteristics. In accounting, it must be repeated, each transaction has at least two aspects, each of which may represent either an addition or a subtraction in appropriate categories. Statistical categories, being increased by each unit, are one-sided only. Accounting categories must be two-sided to provide for either addition or subtraction. The class (balance) may be increased or

decreased depending upon the effect of the transaction. The familiar ledger account is provided to express this two-sided classification. Its twin parallel columns permit the record of increases on one side and decreases on the other. Statistical classification seldom uses two-sided categories.

Summary in accounting differs from summary in statistics because of the difference in classification. To summarize a class in statistics it is sufficient to find the total number of units therein. To summarize an accounting class demands first the adding of the details on each side of the account and then the offsetting of total debits against total credits to determine a remainder or balance. The result of classification and summary in accounting is not a list of totals; it is a series of remainders. A trial balance differs from a statistical list of totals in just this respect.

Presentation of data is an important part of any information-providing service. Accounting and statistics make use of similar devices to present the data which they gather. Statistics uses a table to present its data; accounting uses financial statements. Both tables and statements are tabulations presenting in condensed form the classified and summarized essence of a mass of numerical facts. Yet similarity in the general nature of tables and state-

ments is accompanied by dissimilarities in construction and significance. Some of the most important problems of financial-statement preparation are reflected in these dissimilarities. A careful comparison of financial statements and statistical tables provides an insight into the special problems of statement construction.

Older types of financial statements have a marked resemblance to simple statistical tables. For comparative purposes a simple statistical tabulation and early forms of profit and loss statement and balance sheet are presented below. A brief study of them will show the similarity.

ENROLLMENT IN SCHOOLS AND COLLEGES IN  
THE UNITED STATES, 1928<sup>a</sup>

	Number	Per Cent
Elementary and kindergarten....	23,503,416	80.7
Secondary schools.....	4,321,361	14.8
Colleges and normal schools.....	1,143,141	3.9
Private commercial and business schools.....	188,368	0.6
Total.....	29,156,286	100.0

The three tabulations have many similar aspects. Each contains two lists of numerical data. Each presents totals broken down into subclasses. All are dated to indicate that the data refer to a specific period or point of time. Indeed, the general similarities are so obvious as hardly

#### PROFIT AND LOSS SHEET<sup>4</sup>

Dr.			Cr.
1838		1838	
Jan. 31 To Charges.....	\$ 337.00	Jan. 31 By Real Estate.....	\$ 200.00
Jan. 31 To Stock.....	1,800.50	Jan. 31 By Interest.....	7.50
		Jan. 31 By Ship to Orleans.....	420.00
		Jan. 31 By Commission.....	180.00
		Jan. 31 By Profit and Loss.....	30.00
		Jan. 31 By Merchandise.....	1,300.00
	<u>\$ 2,137.50</u>		<u>\$ 2,137.50</u>

<sup>a</sup> Compiled from *Statistical Abstract of the United States*, 1930, by Gemmill, P. F., and Blodgett, R. H., in their *Economics, Principles and Problems*, Vol. II (New

York, 1937), p. 251.

<sup>4</sup> Littleton, A. C., *Accounting Evolution to 1900* (New York, 1933), p. 146.

BALANCE SHEET<sup>8</sup>

Dr.			Cr.
1838		1838	
Jan. 31 Merchandise.....	\$ 1,100.00	Jan. 31 By Bills Payable.....	\$12,650.00
Jan. 31 Cash.....	18,853.00	Jan. 31 Hampshire Monroe Co.....	700.00
Jan. 31 Bills Receivable.....	11,007.50	Jan. 31 Reed & Barber.....	4,000.00
Jan. 31 Bellnap & Hamersby.....	1,500.00	Jan. 31 Stock.....	18,900.50
Jan. 31 Spaulding & Stone.....	800.00		
Jan. 31 Brown & Parsons.....	1,140.00		
Jan. 31 J. Burt.....	190.00		
Jan. 31 T. Imley.....	1,400.00		
Jan. 31 Andrus, Judd & Franklin.....	360.00		
	<u>\$36,250.50</u>		<u>\$36,250.50</u>

to need specific mention. Yet a close scrutiny indicates differences as well.

The principal feature which distinguishes financial statements from statistical tables is the high degree of interrelation among the facts in the former. Later forms of statements are better arranged to reveal these interrelations; yet even in early statements, such as are given here, an interconnection of facts is desirable. Interrelation among balance-sheet items includes the fact that total assets (left column) equal total equities (right column). This is true because assets and equities are but different aspects of the same properties. Asset items show the breakdown of a total fund into various types of property: merchandise, cash, notes receivable, and amounts due from individuals; equities show the various types of claims upon that fund of property. The two, properties and claims, must be equal, for inevitably every asset will be claimed by someone. Thus the item "Stock . . . 18,900.50" may be considered a balancing remainder as in an account; this is appropriate because the owner claims all enterprise property that is not claimed by outsiders.

There are interrelations within the profit and loss statement. Expenses and revenue are related in two ways: first, there is something of a cause-and-effect connection; second, both elements are joint

determinants of the highly significant figure for net income. The cause-and-effect relationship of expense and revenue is not a direct one implying that the incurrence of one will inevitably lead to the other. Yet to derive income one must undertake (invest in) certain costs and expenses. Revenue may not follow the incurring of expenses; yet if the investment has been made by intelligent selection and application, some net income is likely to result. In effect, expense measures the efforts made to obtain revenue; revenue measures the results of those efforts.

This leads to the second interrelation of expense and revenue as determinants of net income. The amount of net income indicates the success of operations by measuring the amount by which accomplishment exceeds effort. Neither costs nor incomes taken alone can determine net profit or show definitely the results of operating activities. Yet when offset against one another in total they do reveal the net profit or loss results.

There is also interrelation between the balance sheet and the profit and loss statement. The amount of net profit for the period should constitute an analysis of any change in the balance-sheet item called "Stock" made during a fiscal period (except for additional capital investments and withdrawals). Net profit or loss is the increment or decrement to the owner's interest that is due to operating activities;

<sup>8</sup> *Ibid.*

hence it is added to the amount previously measuring his claim. Other interrelations exist between the statements and within each, but they are not so evident in simple statements as in more detailed ones which will be presented later.

No such interrelation of facts is designed into statistical tables. Duality such as is common in the balance sheet (assets and equities) and in the profit and loss statement (expense and income) is rarely if ever found in statistical tables.

A useful effect of interrelation of items in financial statements is seen in the additional significance that thus may be imputed to the several items in each statement. In a statistical table each item is significant (1) in amount, (2) as a component of the total, and (3) in proportion to its fellows. Every item in the financial statements has these features and additional ones. In the balance sheet, for example, the amount of cash is also related to the liabilities because much of it will be utilized to help discharge them; for a similar reason, the proportion between properties that can be readily converted into cash (current assets) and those claims which must soon be paid (current liabilities) is highly significant to readers. The profit and loss statement is likewise made more important because of interrelationship of items. The proportion of each cost to total income and to the net profit is significant, because changes in made costs constitute one of the most direct ways of influencing the amount of net profit. Likewise, the way in which each component of total income is causally related to expenses and to the net result is significant.

To summarize, early financial statements are much like statistical tables in being tabulations of numerical data; but there is an important difference in the fact that financial statements are given a two-sided nature which, among other things, provides additional significance by helping

to establish interrelationships between individual items.

Financial statements did not long remain so simple as the ones illustrated. Increasing complexities of business operations and the need for more detailed information combined to bring into use statements that were more complete in detail and better arranged as to material. The balance sheet in its two-sided form continued to predominate, but interrelationship of items has been made to stand out through the use of subtotals and better positioning of items on the page. The income sheet is now seldom presented in a two-column form, but is usually arranged as a series of subtractions and remainders that derive the net profit figure.

The evolutionary development which resulted in the modern income statement had several distinct steps. First was the simple "account form" illustrated here. Then subtractions and subtotals within the two-sided lists of incomes and expenses was worked in to make the computation of net income easier to follow. This was followed in turn by a more complicated arrangement, still in account form, showing the statement subdivided to produce in separate sections the gross profit on sales, the net trading profit, and the net profit for the year. The derived figure in each section was forwarded to the succeeding section. This complicated form apparently was too technical to satisfy the demand for financial information which followed the wide dissemination of capital stock in the early part of the twentieth century; consequently, a "report form" of financial statement was developed to meet the needs of statement users better.

For use in continuing the analysis of financial statements as statistical tables, there are presented at this point: an example of a complex statistical table, an income statement in report form, and a modern form of balance sheet.

TABLE SHOWING BY YEARS THE NUMBER AND AMOUNT OF REAL ESTATE TAXABLE AND NON-TAXABLE MORTGAGES IN WISCONSIN<sup>6</sup>

Year	Number and Amount of Real Estate Mortgages in Wisconsin					
	Total		Taxable		Non-Taxable	
	Number	Amount	Number	Amount	Number	Amount
Total						
1890						
1891						
1892						
....						
....						
....						

THE INGRAM MANUFACTURING COMPANY<sup>7</sup>Profit and Loss Statement  
Year Ended December 31, 1933

Gross Sales.....		\$228,625.00	
Less Returned Sales and Allowances.....		1,315.00	
Net Sales.....		\$227,310.00	
Less Cost of Goods Sold:			
Inventory—Finished Goods, December 31, 1932.....	\$ 10,400.00		
Add Cost of Goods Manufactured.....	170,299.00		
	\$180,699.00		
Deduct Inventory—Finished Goods, December 31, 1933.....	9,500.00	171,199.00	
Gross Profit on Sales.....		\$ 56,111.00	
Deduct Selling Expenses:			
Advertising.....	\$ 7,320.00		
Salesmen's Salaries.....	8,000.00		
Salesmen's Traveling Expense.....	6,950.00		
Insurance.....	65.00		
Taxes.....	64.00		
Miscellaneous Selling Expense.....	875.00	23,274.00	
Net Profit on Sales.....		\$ 32,837.00	
Deduct General and Administrative Expenses:			
Office Salaries.....	\$ 4,200.00		
Officers' Salaries.....	6,500.00		
Stationery and Printing.....	415.00		
Office Supplies.....	312.00		
Telephone and Telegraph.....	86.00		
Miscellaneous General Expense.....	475.00		
Bad Debts.....	300.00		
Depreciation—Office Equipment.....	314.00	12,602.00	
Net Profit on Operations.....		\$ 20,235.00	
Deduct Net Financial Expense:			
Bond Interest.....	\$3,000.00		
Interest on Notes Payable and Bank Loans.....	430.00		
Discount on Sales.....	1,617.00	\$ 5,047.00	
Less:			
Interest on Notes Receivable.....	\$ 236.00		
Dividends on Murdock Stock.....	400.00		
Discount on Purchases.....	675.00	1,311.00	3,736.00
Net Profit for the Year.....		\$ 16,499.00	

<sup>6</sup> Secrist, Horace, *An Introduction to Statistical Methods* (New York, 1921), p. 130.<sup>7</sup> Finney, H. A., *Principles of Accounting, Volume I, Intermediate* (New York, 1938), pp. 42-43.



A. MARSHALL, WHOLESALER<sup>\*</sup>Balance Sheet  
December 31, 19—

Assets			
<i>Current Assets:</i>			
Cash.....			\$ 1,430.12
Notes Receivable.....	\$ 500.00		
Accounts Receivable.....	2,331.60	2,831.60	
Less Reserve for Bad Debts.....		540.00	2,291.60
Accrued Interest on Notes Receivable.....			8.10
Inventory.....			4,330.00
Total Current Assets.....			\$ 8,059.82
<i>Fixed Assets:</i>			
Land.....		\$1,000.00	
Building.....	\$6,000.00		
Less Reserve for Depreciation.....	500.00	5,500.00	
Furniture & Fixtures.....	\$1,200.00		
Less Reserve for Depreciation.....	240.00	960.00	
Total Fixed Assets.....			7,460.00
<i>Deferred Debits:</i>			
Unexpired Insurance.....	\$ 80.00		
Unconsumed Supplies.....	120.00		
Deferred Interest on Notes Payable.....	6.30		
Prepaid Rent Debit.....	100.00		
Total Deferred Debits.....			306.30
Total Assets.....			\$15,826.12
Liabilities and Capital			
<i>Current Liabilities:</i>			
Notes Payable.....		\$ 1,200.00	
Accounts Payable.....		1,750.50	
Accrued Interest on Notes Payable.....		7.20	
Accrued Taxes.....		130.00	
Accrued Wages.....		80.00	
Total Current Liabilities.....			\$ 3,167.70
<i>Fixed Liabilities:</i>			
Mortgage Payable.....			3,000.00
<i>Deferred Credits:</i>			
Deferred Interest on Notes Receivable.....	\$ 2.55		
Deferred Rent Credit.....	50.00		
Total Deferred Credits.....			52.55
Total Liabilities.....			\$ 6,220.25
<i>Capital:</i>			
Capital January 1, 19—.....	\$8,865.27		
Add Profit for 19—.....	740.60		
Total Capital December 31, 19—.....			9,605.87
Total Liabilities & Capital.....			\$15,826.12

<sup>\*</sup> Scovill and Moyer, *Fundamentals of Accounting*, 1940, p. 376.



It will be observed that modern financial statements still retain the characteristics which distinguished early statements from statistical tables. The two-sided nature of the balance sheet is still apparent, since assets and equities (the latter being "Liabilities and Capital") are presented in two different lists having identical totals. Duality is not so apparent in the modern income statement, yet it is still present. Instead of two lists of data, the incomes and expenses are broken down into subgroups. The totals of the expenses subgroups are then successively subtracted from sales, and other incomes are added to the remainder, until the final figure of net profit results.

But there are additional features that distinguish modern financial statements from statistical tables. The extensive use of subtotals and subtractions to emphasize the relationship of like items is an outstanding difference. For example, certain assets are grouped and totaled to indicate that they are related by some characteristic in common. The same is true in the income statement, in which various items of expense are grouped to indicate a relationship. Relationships are indicated in other ways, also. Subtraction of expenses from incomes in the profit and loss statement indicates a general connection between expenses and incomes; subtraction of certain expenses from certain incomes suggests that those expenses relate to those specific incomes, for instance, cost of sales and net sales. Also the position of items on the page is sometimes used to indicate relationship. When possible the two halves of the balance sheet are printed opposite one another upon the same sheet or upon opposite pages. This makes it possible to oppose the current assets to the current liabilities, thus indicating the important relationship that exists between the two totals. However, one must not carry this particular method of indicating relation-

ship too far. The same relationship does not exist between fixed assets and fixed liabilities, for example.

Relationships are not stressed to a similar extent in statistical tables, because in general no such important relationships exist among the data. Writers on statistics classify tables as either general- or special-purpose tables.<sup>9</sup> The former are used to present data in tabular form for reference purposes only. This is the type more commonly encountered. Special-purpose tables are utilized when specific relationships within the material require recognition and emphasis. These are somewhat more comparable with financial statements. But special-purpose tables are far less common than general-purpose tables. There is no similar subdivision of financial statements; statements always have important relationships to emphasize.

Not all the distinguishing characteristics are on the side of financial statements. Statistical tables have features not found in financial statements. The use of both column headings and stubs or side-heads to indicate classification is possible in statistical tables to a greater extent than in financial statements. In a financial statement for given data or periods there is just one column heading; that is, everything in the table is expressed in dollars; hence the column heading is an implied dollar sign. When other column headings are used in comparative statements, the presentation amounts to a statistical compilation of financial-statement data. As only a single column is normally used, all classification must be presented by means of the stubs or side explanations. This limits the extent to which classification can expediently be carried. Statistical tables, on the other hand, utilize column heads to indicate classes and subclasses

<sup>9</sup> Walker, H. M., and Durost, W. N., *Statistical Tables* (New York, 1936), p. 1.

almost as much as stubs. Note, for instance, the use of column heads in the table on page 405. More extensive classification is thus made possible; indeed, the extent to which classification can be carried when both column heads and stubs are used is remarkable. It goes far beyond the limits of practicable classification in financial statements.

The differences between statistical tables and financial statements discussed here are important enough to justify a conclusion that accounting statements must be looked upon as something different from tables. Different problems of construction are involved because: (1) financial statements do not permit the presentation of complex classifications calling for many column heads; and (2) many relationships nevertheless exist among the items of information to be presented, and full display therefore places a considerable burden upon suitable sideheads.

Tables and financial statements also have different relationships to their respective fields, a fact that supports the conclusion that statements are more interpretive than tables. Statistical tables commonly are but a small part of the statistician's report. They are used as a step in the process of analyzing the material.<sup>10</sup> The statistician uses other devices such as mathematical analyses, textual comments and explanations, charts, and graphics to help present data in an interpretive and explanatory manner. Tables are not relied upon to give the reader much explanation; they generally serve only as reference material. When tables are an essential part of the report they are accompanied by explanatory textual material which serves to clarify their technical presentation of information.

Financial statements have an entirely

different function. The accountant uses few collateral interpretive devices. He restricts himself to an occasional accompanying ratio or percentage analysis and a very sparing use of graphics, and resorts to textual comment sparingly lest he be considered as expressing unwarranted opinions. These self-imposed restrictions force the financial statements themselves to be the accountant's principal means of explaining the data he has collected. This means that financial statements must not only present dependable data; the facts must be presented in such a way as to make them largely self-explanatory. The statements, therefore, bear a great burden of responsibility to interpret data to the reader as simply as possible, because they usually stand alone.

In justice to the accountant it must be added that financial statements have been developed into an excellent means of interpreting the information collected by bookkeeping. Statistics may be far ahead of accounting in the extent to which it has carried the use of mathematical analyses and graphic presentation; yet, without these aids, accounting has made of financial statements an admirable interpretive device not excelled in statistics. Through the use of grouping and subtotals to express similarity, subtraction and offset to express dissimilarity, and sequence or order to indicate relative emphasis, financial statements provide a well-planned means of calling attention to the significant and important information they contain. When they are studied with some understanding of business operations, their message is easy to grasp.

This discussion has emphasized the dissimilarities of accounting and statistics more than the similarities. This has been done in order to show that financial statements are more than specialized forms of statistical tables. Yet there are many similarities in the two fields. In fact, the

<sup>10</sup> Croxton, F. E., and Cowden, D. J., *Applied General Statistics* (New York, 1939), p. 5.

similarities are so evident that it might seem unnecessary to outline them. Both statistics and accounting are subdivisions of the quantitative method of analysis; both deal with numerical data in mass form and have common problems in the collection, classification, and presentation of factual information. Such marked similarities of nature, function, and problems suggest that some of the rules or standards evolved for the treatment of data in statistics may apply to the treatment of transaction data in accounting. The very existence of two such comparable fields implies that one can draw upon the experiences and principles of the other for ideas as to how best to collect, classify, and present its own data.

As the chief interest here is in financial statements and accounting, a brief search of the literature of statistics was made to discover what regulations governing the compilation of statistical data could be considered as also applicable to accounting. The following are some standards for statistical treatment of data which seem to meet this test. Classification of the rules has been made and some modification of phrasing has been undertaken to indicate more clearly their possible application in accounting.

#### A. General Rules

1. The presence of bias in the collection or presentation of data is improper and sufficient to discredit the entire undertaking.<sup>11</sup>
2. The omission of an important factor is improper because it may lead to improper conclusions.<sup>12</sup>

#### B. Classification Rules

1. Distinction used as the basis for setting up classes shall be such as will produce aggregates that are significant and only such aggregates.<sup>13</sup>

2. In every instance, so far as possible, comparability of the data with corresponding data in other statements, past and present, should be preserved.<sup>14</sup>
3. Classification should not be too detailed to fit the data.<sup>15</sup>
4. The detail of the classification must represent fairly the significance of the data and must not impose a significance not inherent in the data.<sup>16</sup>

#### C. Presentation Rules

1. In general a report should contain all of the data supporting its derived figures, so that a reader may, by performing the proper processes, obtain any figure given.<sup>17</sup>
2. In any tabulated data the order of the items should conform as nearly as is possible to the relationship, causal or otherwise, existing between the items.<sup>18</sup>
3. The association of data which are not comparable or which imply a nonexistent relationship is improper.<sup>19</sup>
4. The data must contain no concealed classifications which might invalidate the conclusions drawn from the apparent classifications.<sup>20</sup>

The propriety and applicability of these standards in accounting need no detailed amplification. Indeed, they may be regarded as the equivalents, stated in careful phraseology, of informal practices that prevail generally in accounting.

Statistics and accounting have much in common—so much, in fact, that certain rules adopted by statisticians for the proper treatment of statistical data are equally applicable in bookkeeping and accounting. On the other hand, financial statements and statistical tables are sufficiently different from one another that the problem of constructing financial statements is not the same as that of preparing statistical tables. Financial statements are

<sup>11</sup> *Ibid.*, p. 39.

<sup>12</sup> *Ibid.*, p. 39.

<sup>13</sup> *Ibid.*, p. 40.

<sup>14</sup> *Ibid.*, p. 51.

<sup>15</sup> Lovitt, W. V., and Holtzclaw, H. F., *Statistics* (New York, 1929), p. 27.

<sup>16</sup> Croxton and Cowden, *op. cit.*, pp. 9-10.

<sup>17</sup> *Ibid.*, p. 12.

<sup>11</sup> Croxton and Cowden, *op. cit.*, p. 7.

<sup>12</sup> *Ibid.*, p. 8.

<sup>13</sup> Bailey, W. B., and Cummings, John, *Statistics* (Chicago, 1917), p. 38.

the most important single device used by accountants to present information in an explanatory, understandable fashion. Therefore, they should be consciously designed in such a way as to facilitate the recognition of relationships that are in-

herent in financial data. And knowledge of the ideals and limitations of statistics should make accountants even more alert to their over-all duty of disclosing factual truth not only dependably but understandably as well.

## CASE HISTORY OF A TERMINATED CONTRACT

ROBERT G. ALLYN

IN PRESENTING the following case history of a terminated, government fixed-price subcontract, it is hoped that someone may profit by another's experience. No suggestion should be read into these facts that this article is offered in a carping or deprecating way. On the contrary, one can only wonder at the stupendous task faced by the administrators of the Contract Settlement Act of 1944 and the perspicacity with which they have handled its very broad provisions. The businessmen of this country can rest easily, at least in respect to the thought that the Congress and those who have been given authority under the Act have "planned" to "facilitate maximum war production during the war, and to expedite reconversion from war production to civilian production as war conditions permit."<sup>1</sup> The problem of reconversion was not handled quite so expeditiously during and after World War I.<sup>2</sup>

Inasmuch as the contract under consideration in this article has only recently been settled, proper names will be omitted. Hereafter, the subcontractor will be referred to as Company X; the prime contractor as Company Y, and the contracting governmental agency as Agency Z.

When the telegram to cease production was received by Co. X from his customer, Co. Y., some steps had already been taken by X to plan for this event. The auditor and the cost accountant had attended a three-day "Termination School" and were at least acquainted with the broad outlines and the main problems involved in contract settlements. Unfortunately, this knowledge, or an appreciation of the importance of the problem, was difficult to impart to the other executives of the organization. Preoccupation with present war work is probably the cause of most of the delay in settling contracts, along with the lack of help to whom authority can be delegated. In addition, Co. X had set up cost records by which purchases of materials, payment of labor, and factory manufacturing expenses were allocated wherever possible to specific government contracts, of which Co. X held at least four at one time. Cost record cards were identified with each contract by appropriate nomenclature set up by the planning department to coincide with the parts and assemblies called for on the drawings. Inventories had been set up on a perpetual basis and were catalogued according to raw stock, parts, and assemblies; each classification was given numbers to correspond with the numbers shown on the parts lists prepared from the drawings. Identification of the physical inventory

<sup>1</sup> Sec. 1, par. (a) Contract Settlement Act of 1944.

<sup>2</sup> Cf. Smith, Edw. Paul. "Training Contractor Personnel in Termination Procedures," *ACCOUNTING REVIEW*. Vol. XX, No. 1 (January, 1945), p. 77.



in the stockroom, however, was not organized as carefully as the paper records were. The rapid growth and accumulation of stock, together with the lack of storekeepers conversant with the products, made complete segregation and identification of supplies and parts difficult. Production orders passed through the plant pre-numbered and identified by part or assembly number and by contract number. In short, steps had been taken through some education of personnel and modification of an already existing cost system to insure Co. X that it would have the necessary data on hand when "T Day" arrived.

Immediately upon receipt of the "cease work" telegram, the foremen in the factory were ordered to stop work on all production orders allocable to the terminated contract. In many instances, this cessation was hasty and wasteful as the work in process consisted of costly assemblies, which could have been finished with an additional operation or two, and at a slight additional cost in proportion to the total cost of the assembly. It was subsequently learned that permission could have been granted by the local office of Agency Z or by the prime contractor, Co. Y, to finish some of these assemblies.<sup>3</sup>

Fortunately, there was no difficulty in notifying X's subcontractors to cease work. They were few in number and their work had not progressed far enough to warrant their submitting a claim. In one case, however, a supplier of raw stock had made a shipment the day he received his telegram, so that the shipment en route became a part of X's inventory. This might have been the subject of a controversy had not Co. X later purchased this material for another war contract, thus removing that item from the claim.

<sup>3</sup> An important reason for the waste involved in work in process is the inability to decide whether the work would be commercially valuable if completed.

Arrangements had previously been made with the foreman of the stock room to take an inventory in the event of termination. He had inventory tags printed, two copies each, with a carbon insert. There was space on each tag in which to enter the part or assembly number, production order number (in the case of work in process), and the number of pieces. Later it was learned that all of the inventory should have been weighed and classified as to metal content, because most of it was determined to be scrap. This information should therefore have been entered on the inventory tags and records at the time the inventory was taken to avoid frequent, unnecessary handling. The representatives of Agency Z informed X that it could not arrange for scrap-inventory disposal without weights and classes of metals. It is observed that on Termination Inventory Schedules 2B and 2C, no mention is made of weights, unless, of course, the unit of measurement is by weight. In Co. X's case, the unit of measurement, except for raw stock, was in terms of either piece or length. Nevertheless, much time could have been saved if the weights of metals had been entered for each part and assembly listed on the inventory forms. Moreover, Agency Z also wanted a recapitulation of weights in terms of steel, aluminum, brass, etc.

After the inventory had been taken, stored away in boxes and bins in a locked storeroom, the job of costing it was begun. Purchased parts and raw stock items were priced by the purchasing department. Finished components and work-in-process items were priced by the cost department, which used the cost cards which had been set up arithmetically to show average total unit-lot costs. Some difficulty was encountered in pricing the work in process. The stockroom foreman had neglected to note on his inventory records the last operation completed or an estimate of the



percentage of work done on the parts and assemblies. This information was necessary in the case of parts, because of a production order calling for 100 pieces, half might be 90 per cent complete, perhaps requiring only anodizing, and the other half in the primary stages of production. In the case of assemblies, parts were added at different stages of production. In other words, the inventory as given to the cost department merely listed so many of each part or assembly in process. It was then necessary for the cost accountant and the stockroom foreman to go into the stockroom and physically segregate the parts and assemblies by percentage of completion if it was possible to do so. Even if the foreman had originally noted the operation last completed, difficulty would have been encountered because the workers whose work was highly skilled, and oftentimes required ingenuity, made changes in the original specifications without consulting the planning department. Getting out the work was considered all-important. The paper work would catch up later when operations smoothed out.

After completion of the clerical work on the inventory, the next step in the settlement of Co. X's claim was to negotiate with the prime contractor and with Agency Z. This proved to be the most confusing stage. The prime, Co. Y, did not send instructions as to the preparation of the claim for a month. In the meantime, Co. X had "taken the bull by the horns" and had contacted Agency Z regarding inventory disposal. Agency Z promptly sent its representatives to X's plant, inspected the inventory, and requested ten copies of the inventory schedules for its office and four additional copies for another office in charge of distributing critical inventory items.<sup>4</sup> These copies were duly prepared and submitted. A

<sup>4</sup> This requirement has since been abolished.

minor difficulty was encountered in duplicating the inventory schedules. In the first attempt to "ditto" the inventory schedules, the government-supplied forms were used. The paper, however, was not adaptable to the gelatine type of duplicating machine. It was then necessary to have the forms printed on a smooth, heavier-stock paper. The expense of printing, by the way, is an allowable post-termination expense.

After the inventory was prepared and submitted to Agency Z, it was returned promptly for revision. One change requested was the classification in detail of a group of miscellaneous items, having no commercial value, even though the total value of the group was less than \$100 and each item less than \$10 in value. It was later learned in discussing this point with different representatives of the armed services that unless the inventory consists of a group of odds and ends, such as bits of wire, tubing, etc., that are not identifiable, it is virtually necessary to list every inventory item separately regardless of value or quantity involved. The *Joint Termination Regulations*<sup>5</sup> and the instructions for the completion of terminations claims are not uniformly interpreted on the subject of classification of inventory, at least with respect to miscellaneous items. In classifying its tools, jigs, dies, and fixtures, Co. X lumped them all together and listed them in one amount. Because they were of special type, not allocable to any other contract, and had no commercial value, scrapping was recommended. The inventory also had to be revised by the addition of a schedule

<sup>5</sup> Par. 425.1, 425.2, 425.3, *Joint Termination Regulations*. Revised Apr. 20, 1945—cf. also par. 964 J.T.R. "Instructions for Use of Standard Contract Settlement Proposal Forms." Par. 16 of those instructions states that items having a cost of less than \$100 need not be listed separately but may be lumped together under a "sundry" caption with only a general description of the type of items, provided that the aggregate amount included does not exceed \$5000 or 20% of the total inventory cost, whichever is less.

showing the approximate weights of the metals used in making the tools. Here again time could have been saved if this information had been requested and recorded at the outset, at the time the inventory was taken. This was a reasonable request, because it would be impossible for the property disposal officers of Agency Z to sell or to permit Co. X to buy scrap unless the weight was known. Finally, some question arose regarding the reporting of critical items to Agency Z. In a critical list prepared by Z, certain minimum quantities and values were listed as reportable. A question arose as to whether minimum quantity or value governed. As yet the answer is not clear.

By the time the inventory schedules had been corrected and amended, prime contractor Y had returned to the picture with a well-prepared brochure of instructions. After several telephone conversations with Co. Y, X was convinced that it must deal directly with Y and not with the local representatives of Agency Z. Therefore the negotiations were begun all over again. Fortunately, Co. Y was not so extravagant in its demands for copies of forms; it wanted only four copies of the claim and four copies of the inventory schedules. Accordingly, the claim was prepared, on the inventory basis, following the sample completed forms illustrated in Section IX of the *Joint Termination Regulations*.

Within a week following the submission of this claim, Co. X was somewhat surprised to be visited by two auditors of Co. Y, and informed that this was "routine procedure" and necessary in order that Co. Y could answer all of the questions put to it by its contracting officer. Y's auditors first checked the inventory, making spot physical checks. Invoices covering purchased parts and raw material were then spot-checked. Cost record cards were verified in some detail. From a parts list, a complete listing of all parts and assemblies

required for the contract was prepared and compared with the inventory. Any item on the inventory in excess of the quantity required for completion of the contract was questioned. In all cases, the reason for the overage was due to a minimum run or a minimum quantity necessary to be purchased. A few small errors were disclosed. For example, a part was priced on Form 2C (Work in Process) at a finished-unit price, because of an original error in failing to list the part as semi-finished. This discrepancy was observed when the same part was also listed on Form 2B (Finished Components) at the same price.

During the course of the field audit Company X decided that it could use some of the inventory that had been listed. This necessitated further revision of the inventory schedules and the claim. While closer cooperation among the executives of Co. X might have obviated some of this piecemeal reduction of the inventory, planning for disposal of termination inventory was difficult because of rapid changes in manufacturing processes. No one could accurately foresee whether parts made for one contract could be used on another. Experience has shown, however, that it is desirable for the contractor to dispose of all the inventory he can, even scrap. If the government agencies are forced to dispose of a contractor's inventory, the contractor is plagued with phone calls, letters, and visits from prospective buyers. More time and added expense are often consumed than would have been necessary had the contractor bought and disposed of his inventory, even at a loss.

Upon completion of the audit, which took three days, the claim was accepted. On the original claim, Co. X had requested a profit of 6 per cent of the total inventory cost, plus the proportionate part of the general and administrative expense allocable to the contract. Since no attempt was made to negotiate a profit, the formula

settlement was followed.\* Co. Y allowed a profit of the lesser of either 6 per cent of the inventory cost or 2 per cent on unprocessed inventory plus 8 per cent on processed inventory. The cost, of course, excluded that of any finished units on hand which had not been invoiced. These units were listed on line 15 of Form 1, inasmuch as the invoice price already included general and administrative expense and profit. As contractor X had made no claim for post-termination expense or interest, there was no question concerning these items. Nevertheless, prime contractor Y, upon receiving the settlement proposal from X for the second time, inquired of X whether the company wished to make a claim for interest. X had failed to note on line 16 of Form 1 that it was making no claim for interest. This necessitated sending four copies of a waiver to the prime contractor.

About a week after the corrected inventory schedules and claim had been re-submitted, Agency Z again sent its representatives to inspect the inventory further with a view toward giving authority to X to dispose of the inventory as scrap. Unfortunately, Co. Y had failed to send copies of the amended inventory schedules to agency Z, so that it was not apprised of the changes made by X and Y. This made it necessary for Z to review the whole matter with them for correcting their schedules to bring them into agreement with those X had finally submitted to Y. Agency Z was anxious to make a prompt decision regarding X's recommendations for inventory disposal, as it had been given a "deadline" by its higher echelon. To that end, Co. X and a representative of Agency Z prepared a classified listing of all parts and assemblies for which scrapping had been recommended, together with the metallic weight of each item. As most of the inventory was to be scrapped, this proved to be a long

and tedious job, and one that might well have been accomplished at the time the inventories were originally listed on the inventory schedules, Forms 2A, 2B, 2C, and 2D. Any assembly which was composed of different metals which could not be weighed separately was listed as "mixed."

Contractor X then submitted a "bid," in four copies, together with scrap warranties, warranting that the scrap that the company was buying would be sold and would not be converted to the company's own use, accompanied by the classified scrap inventory to Agency Z. In addition, copies of a credit memorandum for the usable pieces of the inventory the value of which was to be deducted from the claim were also given to Agency Z. This information was necessary so that the Surplus Disposal Board of Agency Z could dispose of every item of inventory that was not to be retained by Co. X or sold to Co. Y.

The deadline, however, set for Agency Z to act upon the inventory disposal came and passed without the necessary authority forthcoming. After a delay of three weeks, the Surplus Disposal Board finally sent formal notice to Co. X that it had accepted X's offer to purchase all of the inventory except two parts which it was decided to report as critical items. A further delay ensued until shipping instructions were received from the governmental agency which was to assume accountability for these critical items. When shipping instructions were at last received, another problem arose when it was discovered that a few of the parts (purchased parts) were defective. A resident inspector who had since taken his station at Co. X's plant had made the discovery and consequently requested X to correct its inventory schedules and claim. To avoid the delay involved in returning the defective parts to the vendor and preclude more paper work, Co. X purchased the defective parts and issued a credit memorandum to Co. Y,

\* Footnote to *Joint Termination Regulations*, Par. 931 d(2).

with a copy to Agency Z, covering the cost of the defective parts deleted from the claim.

Within a week, the critical items had been shipped from Co. X's plant, and Agency Z had delivered to X a final statement to the effect that Co. X had been relieved of accountability for all of the termination inventory, and that Z had approved the claim. Again, though, correspondence between Agency Z and prime contractor Y was delayed, so that it was necessary for Co. X to remind Y of its obligations to settle the claim. Co. Y replied that it had not received notice of the "clearance" from Agency Z. Co. X supplied Y with a photostatic copy of the release.

At long last, (seven months from the date of the notice of termination) Co. X received release forms from Co. Y to be signed and returned, together with an

invoice. A check in full payment was received shortly after the invoice was rendered.

Throughout the period consumed in settling this claim, the delays could be attributed equally to each of the participating parties. None of the parties was entirely to blame. Co. X was especially impressed with the spirit of courtesy and cooperation that pervaded the efforts of the negotiating parties in settling its claim. Prime contractor X and Agency Z are to be commended on their choice of representatives. The latter performed their duties efficiently and did everything in their power to maintain amicable relationships and spread goodwill. There is no doubt that as the number of terminations increases, and the machinery for settling claims gets into high gear, much of the annoyance caused by delays will be removed.

## INCOME TAXES AND CAPITAL INVESTMENT

L. B. McINTIRE

**T**AXATION for revenue only." This phrase expresses succinctly the reaction of many people to the taxes imposed by the Federal government since about 1935, when the tax on undistributed profits of corporations was enacted. It has been generally inferred by critics of the Federal Administration that Federal taxes have been imposed for some reason other than revenue. While there is enough truth in this inference to make it generally acceptable, still it must perhaps be admitted that revenue has been the primary purpose for Federal taxes.

The charge has been made, and fairly, that "New Deal" taxes have brought about bad economic results. The cure for these bad results has been suggested to be "Taxation for revenue only"—which sug-

gestion carries the inference that tax laws should be framed without consideration of anything but the revenue to be obtained. The fallacy here is plain. For if certain tax laws produce bad economic results, then is it not reasonable to believe that relatively good economic results might be obtained by some other tax laws?

Nor should revenue and economic results be the only considerations in framing tax legislation. To get a clear picture of proper deliberative procedure for framing tax legislation, the following considerations in approximate order of importance are suggested:

1. *Revenue and Ability to Pay*—These mutually conflicting considerations are basic. Revenue is limited by ability to pay. If desired revenue should exceed ability to



pay, then economy in expenditures would become, not only desirable, but necessary.<sup>1</sup>

2. *Equity and Simplicity*—While less basic than revenue and ability to pay, these mutually conflicting considerations are imperative if democratic principles and tolerable administration are to be achieved. The present extreme of complication in tax laws has come about partly because of undue concern for equity as against simplicity.

3. *Economic Results*—The probable economic results of proposed taxes should be carefully considered. The legislative guide to this consideration in the past was furnished to a large extent by lobbyists for interested pressure groups. Better guides are available now,<sup>2</sup> and there would seem to be little excuse for bad economic results in the future.

#### ECONOMIC CONSIDERATIONS

It has been suggested recently from more than one quarter that the general welfare would be enhanced if accountants would take a more active interest in the field of economic thought and exert a benevolent influence on legislation affecting national and international economics.<sup>3</sup>

<sup>1</sup> It is not considered that financing by borrowing upsets this postulate. In such a case retrenchment is only delayed.

<sup>2</sup> Two general guides for the future should be investigated. One is the recent economic history of countries in which experimental tax legislation has been enacted. Canada, England, and the United States have had experience which is perhaps most applicable to our problems. Mr. Roosevelt at the advent of his administration frankly enunciated a policy of experimental legislation. The lessons to be learned from a review of this experimentation should not be overlooked. Another guide for future tax legislation is the body of economic research and the conclusions drawn therefrom. Notable here is The Brookings Institution, Washington, D. C., incorporated in 1927, which organization has published its findings and conclusions in book and pamphlet forms.

<sup>3</sup> "A closer relationship" between accountants and economists was suggested in an editorial in the *Journal of Accountancy* for March, 1945, and reference was made to an article by Harry Norris in the *Economic Journal* (quarterly of the Royal Economic Society, London) for December, 1944, stressing "the desirability of better understanding and closer cooperation between economists and accountants."

There is much to be said in support of these suggestions, although increased interest in economic thought and legislation should in no degree be limited to accountants, of course. However, accountants are especially concerned with taxation and are in a position to influence legislation in this field, which so tremendously affects the economic life of the nation. In order that this influence be exerted in behalf of the general welfare, we should at all times be cognizant of the bad economic results to be avoided in the future and the means of achieving desirable results.

What bad economic results derive from improper tax laws? In finding the answer to this, we should keep in mind (1) the purpose of the economic system, which is to provide equipment, goods, and services for human use and consumption; and (2) the fundamental elements of the economic system, which are capital and labor and the management which directs them. In general, we may say then that retarding or prevention of production or services for human use is bad; and, more specifically, that discouragement of the productive use of capital is bad, unemployment or waste of labor is bad, and the frustration of the productive efforts of management is bad.

Many loud noises inspired by the extreme complications and involvements of Federal taxation have recently been heard. To deal with these complications and involvements constitutes a severe burden on management, which should be allowed to direct its efforts as far as possible to production of goods and services. This misdirection of management is increased in severity at this time when tax rates are so high as to make oversights so costly that tax considerations individually almost outweigh efficiency of production and economy of operation. Simplification then appears from the standpoint of management to be a supreme objective in tax legislation.



Unemployment, which is a waste of labor, has been the most vivid weakness of our economic system. The causes of this labor waste are rather involved,<sup>4</sup> but they cannot be attributed very directly to the Federal tax system. However, it would be a secondary result if tax laws operated to discourage capital investment, since the means of labor's production in a free economy is dependent for the most part on privately provided capital.

The importance of capital investment is not fully appreciated by the public generally, which has been led to believe that depressions are caused by overproduction. If this were true, of course, then we would not be interested in encouraging capital investment, since capital investment increases productive capacity. What we are interested in, as stated by Mr. Harold G. Moulton, President of The Brookings Institution, is "a dynamic situation in which increasing quantities of newly created goods and services would become available for everyone."<sup>5</sup> Mr. Moulton suggests an aggregate national income of 200 billions,<sup>6</sup> whereas the productive capacity of the United States in 1929 was less than 100 billions.<sup>7</sup> It would thus appear that the needs of our people, as determined by Mr. Moulton, would roughly require a doubling of our productive capacity. Of course, productive capacity has been tremendously built up for war production, but much of this is not suitable for peacetime operations without considerable reconversion.

Assuming that productive capacity would be adequate, is there any assurance that it would be used to produce the 200 billions of national income suggested? The answer

is "no." In 1929, the national income was about 84 per cent of the national productive capacity.<sup>8</sup> Mr. Moulton's study indicated, however, that disuse of existing productive capacity was due to price and trade abuses; hence we need not consider this problem as having important tax aspects. This consideration may be passed by simply with the admonition that future tax laws avoid burdening the use of existing facilities of production.

The fact still remains that our productive capacity is inadequate to provide a high standard of living for all our people.

Consideration of the economic results of Federal tax legislation then narrows down to its effect on capital investment. It should be kept in mind that present taxes were designed for the prosecution of war, under which condition capital investment to a great extent has not been privately provided. It should not be contemplated that these taxes be continued when private enterprise displaces the present public enterprise of war. Therefore, tax provisions presently in force should be examined, whether conceived in peace or in war, to determine changes necessary to fit peacetime economy under a private enterprise system.

What are the tax provisions which, if retained, would discourage investment of private capital?

#### THE DISCRIMINATION AGAINST CORPORATE INCOMES

The chief way in which tax provisions discourage the investment of private capital is the huge discrimination against corporations and corporate income. This discrimination has come about because of the deep-seated impression in the public mind that corporations are lush creatures of the law, performing no social function and growing constantly fatter on the blood and

<sup>4</sup> Prices high and wages low, relatively, result in inability to buy all the fruits of production; the forced drastic price adjustment of inflated inventories discourages further production; and labor is thus left with temporarily reduced opportunity for endeavor.

<sup>5</sup> *Income and Economic Progress* (The Brookings Institution, 1935), p. 83.

<sup>6</sup> *Ibid.*, p. 83.

<sup>7</sup> *Ibid.*, p. 176.

<sup>8</sup> *Ibid.*, p. 176. The amounts are 81.940 billions and 95.508 billions, respectively.

sweat of the people. In reality, the corporation is an instrument by which individual savings, small and large, can be combined to work effectively to utilize labor and provide goods and services for human use. If some of them operate to create monopolies and retard economic progress, correction should be obtained by governmental regulation, such as restriction of patent privileges or severing control of their sources of supply. But discriminatory taxes on corporations penalize the good and the bad alike; they do not correct individual evils; and they discourage generally the use of this effective type of cooperative enterprise. Ultimately, the public suffers by lost employment and lost production.

Theoretically, corporate income should not be taxed at all, because this income is that of stockholders, who should be taxed therefor as individuals. From an administrative standpoint, however, it is desirable to collect taxes on this income at the source, since it would be a Herculean task to follow an infinite number of dividend payments and to distribute retained earnings for tax purposes. It seems logical to follow these considerations with the suggestion that corporate net profits be taxed at a flat standard rate fixed at the basic tax rate for the individual or slightly higher; require the individual to include dividends received in his taxable income; and allow the individual to deduct from his tax a credit for tax paid by the corporation on the dividends received and included in his taxable income. This would achieve simplicity of administration and simplicity of filing. In addition, it would eliminate the present inequity of double taxation of corporate income.

One inequity would remain in that undistributed corporate earnings would not be taxed at graduated individual rates. Two good reasons exist for permitting this inequity to exist. As previously indicated, its correction would be an almost impossi-

ble administrative task. Second, this tax advantage to retained earnings would have a tendency to increase capital investment, which, we have observed, is economically desirable.<sup>9</sup>

Two major reforms in taxation of corporate income should thus be included in our immediate postwar aims: drastic reduction of rates, now discriminatory, and elimination of double taxation.

#### THE DISALLOWANCE OF BUSINESS LOSSES

As presently constituted, Federal tax laws are like a deck of cards stacked against productive enterprise. Such enterprise usually, if not always, entails considerable risks, the profits being often absent or negative for considerable periods of time. In such cases, the purpose of the tax laws has been to collect taxes year by year on profits when earned, without allowing for losses in previous unprofitable years except to a very limited degree. Present provisions allow business losses to be "carried back" two years or "carried forward" two years. These provisions have produced an extremely involved tax situation in some cases. They also afford the privilege of offsetting losses against profits to comparatively profitable enterprises, at the same time limiting the privilege rather severely for businesses which have suffered severe or continuing losses and are therefore most deserving of tax relief.

This year-by-year taxing of profits and the placing of limitations on offsetting losses against profits constitute an inequity, because a heavier tax burden is placed on business income than on other types of income less subject to fluctuations and uncertainties, such as salaries and interest. The most harmful effect is to

<sup>9</sup> This does not mean, of course, that the use of the corporate form as an "incorporated pocketbook" is to be condoned. Present provisions restricting unreasonable accumulation of surplus and current liberal policies of administration seem sufficient safeguards against abuse.

discourage new enterprise, whether it be the formation of new business organizations or new lines of endeavor for established organizations. This discrimination against business income should be corrected by allowing business losses to be carried forward for a period of years long enough to eliminate the discrimination, ten years perhaps.

The carry-back provision should be discarded in the interest of simplification of administration and filing, since equity would be achieved by the carry-forward of losses.

In addition to discriminatory taxation of business profits, capital investment and new business enterprise are discouraged by the limitations on allowance of capital losses. Corporations are allowed no net capital loss deduction, and such losses are allowed to individuals only to the extent of \$1,000 per year. Tax regulations do provide that net capital losses may be carried forward for five years, but provide also that they may be deducted only as an offset against capital gains. These limitations constitute a definite discouragement to new or small incorporated businesses which are seeking funds for operation and to other incorporated businesses which may seem for other reasons to be risky. This effect is exactly contrary to the ideal of free enterprise, which seeks to remove hindrances to new or risk-taking business rather than put obstacles in its way.

Equitably, there seems to be no reason why capital losses should not be allowed against ordinary income. Of course, there is a good argument for not allowing all of such a loss in one year, because it represents an accumulated loss over the period for which the asset has been held. Thus, it would be logical to allow this loss over a period of years equal to the period for which it was held. To avoid involvements in administration and computation, however, it seems in order to suggest a stand-

ard period of time over which a capital loss could be applied against ordinary income, say three years or five years.

#### INCENTIVE TAXES

That Federal income taxes as recently applied have exerted a repressive effect on capital investment has been recognized to the extent that the idea of "incentive taxes" has become a fad. Risk capital having been discriminated against for the past decade, it is now proposed to enact tax provisions discriminatory for risk capital. Proponents of such legislation should keep in mind that two wrongs do not make a right in the field of economics any more than in any other field of human relations. The "gambler's instinct" should also be kept in mind—the providers of risk capital do not require undue inducement to "take a chance" even though they do wish to avoid "stacked cards" and "loaded" taxes. An editorial statement in the *Journal of Accountancy* for March, 1945, bears repeating: "There could be no greater tax incentive to business as a whole than a simple, equitable, and consistent tax policy, which would not be tinkered with from year to year."

It follows that the present tax incentive favoring long-term capital gains should be examined to see whether it really operates beneficially from an economic standpoint. If not, such gains should be taxed as ordinary income, spread over a period of years equal to the holding period of the asset or for a standard period, just as was suggested previously for capital losses. This study should be made regardless of the cries of anguish which may be expected from Wall Street, other brokers, and speculators. The question is to determine whether this one tax incentive favoring capital investment has actually stimulated new investments sufficiently to justify the inequity and the abuses thereby allowed.

The proposal to relieve corporations of a

discriminatory income tax burden can be expected to draw heavy fire, because it would entail increased rates for individuals. However, it cannot be denied that the tax burden should rest directly on the individual because this plan would lend itself more readily to equitable distribution than the present indirect and discriminatory method of putting the heaviest burden on those individuals who provide the capital for and derive income from corporate enterprise. The importance of this is further emphasized by the fact that achievement of equity is a prime necessity if we are to arrive at a system of taxation which can be continued consistently into the future.

Whether corporate income or individual income is used, recognition should be accorded to the changing fortunes of business

and the adversities which befall new business enterprise. Thus, business losses, both capital and ordinary, should be carried forward until absorbed by profits before taxes are levied on the income. This would achieve simple equity by removing tax discriminations against productive enterprise now inherent in the present tax provisions.

In short, it should be recognized that productive enterprise is "the goose that lays the golden egg," and that capital investment is the fundamental element of this enterprise. Federal income taxes should not be discriminatory in their effect on such enterprise; rather enterprises should be encouraged to expand to the end that employment, goods, and services adequate to satisfy human needs and wants shall be provided.

## ECONOMIC AND ACCOUNTING CONCEPTS

RUSSELL BOWERS

ACCOUNTING bears a debated relationship to social economics. The two activities sometimes deal with the same or similar phenomena and hence raise the question of the proper relationship. The fact seems to be that accounting is concerned with only part of the social problems of economics, and it deals with that part necessarily from a different point of view. Nevertheless, accountants and businessmen often err in their judgments about national economic policies when they attempt to reason from accounting concepts and postulates to conclusions about the social economy. It is equally unfortunate, on the other hand, that economists often fail to appreciate both the contributions and the limitations of business accounting in relation to an understanding of their problems.

Economics is concerned with the econ-

omy of a major unit of society, one which extends beyond the limits of any individual firm. Business accounting, on the other hand, deals with the economy of subordinate parts of a larger unit of society. The unit used by the accountant is typically the productive business firm. With what specific unit of society does "economics" deal? Economy is meaningless unless defined in relation to the point of view of somebody or some group taken as a collective unit. In answer to this question we suggest recognition of three distinct "levels" or types of context for any discussion about economic problems. The first is the problem of the individual or natural person as a consumer. Second is that of the business firm as a producer. It is with the firm, often in the form of a corporate enterprise operating as a trading unit within a money economy, that accounting is con-



cerned. The third level is that of national, or, better, total economy.

The economy of the business firm can be expressed adequately in accounting terms. The economy of the individual also may be expressed in similar terms if exception is made for that segment of an individual's economy which is not expressed in money; that is, the individual may economize in the exercise of alternative modes of use of his non-monetary resources, as when he performs a service for himself. The concept of income in a money economy is substantially the same both for an individual and for a business firm. There is merely a shifting of the point of view.

Are the economic concepts of a system of economic relationships for a society as a whole, based upon specialization in production and the exchange of goods for money, the same as those for the individual or firm? It is the contention here that they are different in some very important respects and that these differences too often are not recognized. The failure to distinguish actual differences from apparent similarities is often the cause of discord among people of influence in the formulation and conduct of important national economic policies. Accountants and businessmen are largely of one school of thought, whereas economists, who are interested in national income, are generally of another. The unfortunate result is that often they speak the same language while working with fundamentally different economic concepts.

The sciences of accounting and economics have developed largely independent of each other. George O. May, in *Twenty-five Years of Accounting Experience*, considers accounting a tool of business, and points out that the development of accounting, like the development of business law, has been determined by the practices of businessmen. May has also observed that where accounting and eco-

nomic thought run along parallel lines it is probable that both run parallel to good business practice. Thus, if accounting has diverged from economic theory, a similar divergence is likely to be found between social economy and business practice. In any event it would be a mistake to think of either accounting or economic theory as rigid and exact just as it would be to think of every science as consisting of rigid, exact laws. Accounting may be based on convention and judgment, but it cannot be concluded that accounting is therefore useless or lacking in objectivity. Judgment cannot be avoided in the applications of any science. At the least, accounting presents useful historical facts. While some accountants have conceived of accounting as fundamentally a process of valuation, others have regarded it as a historical approach to business problems. Be that as it may, accounting problems are economic problems based on a limited point of view, that of a particular productive venture or business enterprise.

Under either the valuation view or the historical view the problems of valuation occupy an important place. The accountant insists that a historical record is more serviceable if it ignores fluctuations in the market value of durable assets used in production. He does this with the end in view of centering attention upon the determination in income (or loss) as it accrues to the accounting entity. Thus the going business concern is assumed as a postulate and attention to assets is currently focused on those which are for sale.

Income as thus determined by the accountant serves many purposes, both social and individual. It serves as a basis for making income distributions which greatly influence general consumption and the achievement of current standards of living. Distribution which affects consumption may be made from invested capital instead of from earned increments; but



rational economic behavior always requires a knowledge of the source from which the funds used in consumption are derived.

There are several possible bases of valuation: (1) historical cost of the properties devoted to a particular use; (2) original cost of properties to the particular owner; (3) historical or original cost as in (1) and (2) less estimated depreciation; (4) current market bids and offers if there is a market; (5) estimated cost of reproduction new or in present condition; (6) the sum of cash or equivalent which can be realized from the property less any additional necessary costs; and (7) average or prospective earnings capitalized at the appropriate rate. The determination of any of these bases, with the exception of historical and original cost, is influenced somewhat by the judgment of the appraiser. Thus most of these bases lack that objectivity which is desired in accounting or in any other science.

Actual cost bases, although not often subject to dispute as questions of fact, have the limitation of becoming out of date and hence not useful for some purposes because they are not in agreement with current conditions. But the accountant's problem is one of proof and measurement. He can hardly do more than compile the facts in arriving at a valuation by a given method and state clearly the method used. There still remains the question of judging the adequacy of the valuation method for the particular purpose at hand. But what all these bases of valuation have in common is their usefulness for the particular firm. Their use from the standpoint of the total economy is not so clear.

Accounting may, despite its many limitations, claim to be a science which works with quantitative data involving principles. It can operate within the limitations set by any of these methods of valuation. In any given case it may present the results obtained by one method or it may preserve

the facts by which the results of several methods are obtainable. By operating within known limits, inaccurate or controversial data are confined to relatively subordinate details. Any method which is consistently followed may therefore present facts selected according to some relevant principle. The selection of the principle to be employed in any given case will represent the application of accounting on the highest level. But let it not be forgotten that all the concepts and principles of accounting have been developed from the point of view of the individual productive firm.

When the concepts and techniques of enterprise accounting are applied to the field of a major unit of society such as a nation, the concepts and the techniques of measurement fundamental to the one field may prove meaningless if applied to the other. The economy of an individual enterprise may not move consistently with the economy of the larger social organization of which it is a part. Individual firms operate as subordinate economic departments of a nation just as departments within a complex business enterprise operate as subordinate economic units of that organization. A certain course of action may aggrandize a department within a business enterprise; the course of action may be economical from the viewpoint of the department, but it may or may not be economical from the viewpoint of the enterprise as a whole.

It is recognized in accounting that, so far as the firm as a whole is concerned, one department of a firm cannot make a profit by selling to another department of the same firm. In preparing consolidated income statements the intercompany profits and losses are eliminated from the calculation. This analogy would appear to be valid with respect to private enterprise economy in relation to national economy. A set of accounts for the total economy of a

sovereign nation thus would have to be based on concepts and techniques of measurement different from those appropriate for use in studying the economic progress of an individual or firm. A private economic unit which is small relative to the total economy can measure its own economic progress or its status on any given date in terms of legal tender, especially if contractual liabilities are involved. But similar monetary measures in a national economy can be used only indirectly to indicate short trends or year-to-year comparisons, if at all. This is true even though the figures are adjusted for changes in the value of money, that is, the general price level.

National income data, derived as they usually are from business accounting data, should be adjusted not only for limitations in the value of the dollar as a measuring unit but for other factors as well. The individual firm also may correct its financial data for changes in price level if that type of accuracy is desired; but even then the two situations are not similar. The unadjusted net income of an individual (or firm) as measured by recognized accounting methods is a concrete and specific indication of change in his economic circumstances, because money earned is purchasing power for him at current prices. On the other hand, we find appropriately a desire on the part of the economist to measure national income in terms of physical units of goods and services produced rather than in dollars' worth. But in so doing the economist ignores valuation and hence the essential economic problems.

While adjustment for changes in price level may be helpful in eliminating errors of legal dollar measurement of income for an individual or firm or any other small unit of an economy, accountants generally do not accept this view and their attitude is not wholly without justification. However, the accountant's justification for re-

jecting the use of price level indexes is not the same as that of the economist.

The situation of an individual or firm may be seen more clearly if it is remembered that the individual's money is spendable or acceptable by others. This is a fact which, in modern times at least, is almost wholly responsible for money's having any value. But not all the money in a total economy is similarly spendable except in the case of foreign trade. Save for the part played by foreign trade, money, from a national viewpoint, is a convenient medium of exchange; it is purchasing power for individual trading units only, not for a society or group taken as a whole except when it is used in exchange with a party outside the group.

In accounting, money is used as a measure of value and as a medium of exchange, but most often as a measure of value. All accounts of a business enterprise are expressed in money as a measure of value; but money as a medium of exchange is confined to the cash account and a few other fungible assets. Not all the property accounts held within a sovereign nation can be used similarly as a measure of that nation's economic status. Such property valuation or income measurement is useful only for year-to-year or other short-term comparisons at most.

The difference between the method of determining income for an individual or a business firm and that for a larger unit of society may be made evident by a simple example. If the market price of a certain item of property appreciates and it is sold at a price higher than original cost, the owner of that property gains by the increment just as substantially as if a gain were earned from any other source. The economist, speaking from a social viewpoint, knows that this increment does not represent social income.

Parenthetically it should be added that it is not relevant whether the appreciation

is realized by sale or not. The accountant does not recognize appreciation unless validated by sale but the cogent excuse for insisting on sale is the need for proof of the appreciation and for a means of definite measurement. The increment must be available to the individual in the form in which he wants it, and this ordinarily means cash or the equivalent. If he can sell for cash, proof taken for granted, his doing so is only a formality. The economist also may readily subscribe to this view since the problem does not arise peculiarly within his province. He is inclined to take the accountant's word for it. But the agreement is more apparent than real. The cogent question to the economist is whether a contribution has been made to social product, that is, to the total of goods and services for use by someone in society. Whereas the accountant is searching for an instrument for measuring a spendable increment owned by the individual or firm, the economist is searching for a measure of social product. The social product must be viewed apart from individual claims to the product. If the economist accepts the accountant's results it is for want of a scheme better suited to his purpose. What may be a good measure of an individual's enhancement in economic circumstances may not be a good measure at all of contribution to the social product.

Continuing the kind of example suggested above, if a share of stock is bought for \$100 and later sold for \$150, net of additional costs, the owner has gained \$50 just as substantially as if \$50 were derived from wages, fees, or any other source. But one cannot say that this appreciation of assets (or capital) reflects any increase in social product or social income for the larger economy of which this individual situation of stock ownership is a part. It has been argued correctly that such an increment of \$50 may be the result of someone's reappraisal based upon the antici-

tion of greater earnings from the original investment cost of \$100. But this observation is relevant only from the social point of view. From the individual owner's point of view there exists no similar analogy. True, the owner without selling merely anticipates greater "income," but it must not be overlooked that if he can "cash in" on his expectation immediately (less appropriate discount) he is in a position just as fortunate as he would be if the expected "income" were realized now in connection with the creation of a social product. Whether he does cash in or not is irrelevant to his individual economic circumstances.

The point is that this actual improvement of the individual's circumstances is not dependent upon a contribution to the social product, and this fact should always be recognized. Often errors have been made in matters of national economic policy, and especially with regard to income taxation, as the result of confusing the economics of the individual or firm with the economics of the nation as a whole. The English practice in this regard is inferior to our own. While the English view may be based upon some institutions of great historical importance, the policy is not appropriate to a modern exchange economy. The annual (physical) product of the land in an earlier form of economy, as in Adam Smith's day, no doubt served as an accurate and useful measure of annual income for both the owner and the nation. But in a commercial and monetary society of great specialization in which money and monetary claims are determining factors in buying the products of others, money income based on all transactions, actual and potential, gives fundamentally a better point of departure for the measurement of individual income than does the individual's contribution to a social product.

Accordingly, a satisfactory concept of national income must differ from that of

individual income. Rarely is there anything of consequence to be gained by the assumption that the national income must agree arithmetically with the sum of the incomes of all individuals. But nevertheless the confusion of the two is common even among well-known writers.

Society, or the social group as a whole, cannot "cash in" on that expected income which may cause individual investments to appreciate, but the individual owner of property can do so. The fact that no additional social income is in any way made available to the extent of value appreciation does not justify denying recognition of an increment to the individual, if it is proved and measured. The individual can realize his increment by conversion to cash, by actual consumption, or by other recognized criteria. Even though the individual's increment does not represent a contribution to the social product, he can realize on his claim at the expense of others, and he will seldom hesitate to do so. The increment can be made available as a claim to social product.

In the treatment of the particular individual the incidence of his expenditure on the claims of others, the claims to the social product, can be ignored. The incidence of this additional share of the social product which can be claimed by the individual as a result of spending more individual income, whether derived from appreciation or any other source, is so diffused in society as to be negligible. It is not measurable as it concerns any other person. This is to say that the increment of appreciation in the hands of any individual or firm is extremely small in relation to the total national income. Of course, if the increment in the hands of the individual or other economic unit is exceedingly large in comparison with the total national product, then this analysis does not hold and the incidence cannot be neglected.

The confusion of social and individual income appears most frequently in discussions of capital gains. Some people have contended that capital gains should be differentiated from income, and excluded from the income tax base, as has been the policy in England. While there may be sufficient practical justification for the exclusion of such gains from the regular annual income tax base, the reason for exclusion cannot be founded on the assertion that these gains do not represent individual income because they do not represent social income.

It has been said that capital gains usually are the result of monetary depreciation and are therefore nominal instead of real gains. Such a contention does not rest upon a careful analysis of the situation. Decline in the value of money, which is synonymous with a rise in the general price level, affects all financial items and not merely a class loosely referred to as "capital assets." Capital increments often arise without an increase in the general price level, whereas, on the other hand, there is sometimes an increase in the general price level without appreciation of a particular "capital asset." The attempt to make appropriate adjustments for changes in the general purchasing power of the legal monetary unit merely by excluding capital gains from individual or business income is wholly inadequate.

The accounting effect of a decline in purchasing power of the dollar or other legal monetary unit may be corrected in two ways. One method is to stabilize the purchasing power of the monetary unit by monetary policy. If this procedure is not undertaken by the government, then the only other equitable solution is to use a multiplier or index number to correct the nominal book values which have been expressed in legal monetary units of varying purchasing power. But this correction must be made for every item in the accounts and



not merely for the "capital items." All items will be affected except those whose price happens to coincide with the index of the base date. The revenue, expenses, wages, etc., must also be corrected for the same reason that the "capital items" are corrected. The extent of the correction of any item depends upon deviation from the index and not upon whether the item is regularly traded in or represents a fixed asset.

Accounting in its present form is capable of measuring the economic progress or status of an individual or a business enterprise, with the possible exception of limitations imposed by changes in price level. Even this refinement could readily be added if desired. Economics in any context has a problem similar to that of business accounting in measuring adequacy or progress in providing means of subsistence and enjoyment or the resources required for continued activity; but in social economics the viewpoint is national, or even international, and business accounting methods of measurement are hardly comparable.

What difference does it make whether we change our viewpoint from that of a non-self-sufficient economic unit like the individual or the business firm to that of a self-sufficient social unit? Can we merely add the money incomes of the smaller units and obtain that of the whole? At this point the analogy between a trading unit and a completely self-sufficient economy breaks down. In business accounting there is presumed to be an exchange of equivalent values in every external accounting transaction. Only the external transaction is used in accounting for recognizing a basis of ponderable gains and (sometimes) losses. The transaction device is lost, if an attempt is made to transplant this transaction device of a non-self-sufficient economic unit operating within the money economy to the larger self-sufficient eco-

nomic unit. The difficult could be appreciated more fully if one attempted to construct a consolidated income sheet for all individuals and business enterprises in the United States. To a task as technically difficult as constructing this consolidated report, assembling all the data, and making all necessary adjustments and corrections, there must be added the inadequate principle on which the concept is based.

The fundamental measuring device used by the accountant is the business transaction between parties of independent interests. If the dollar is the surveyor's tape of accounting measurements, the transaction between independent economic units constitutes the activity of the surveyor on the job. The measuring of national income by applying enterprise accounting technique is inadequate, because the transaction gain of one party is supported only by a "write-up" on the books of the other party. From the viewpoint of the two combined, as they are combined in the viewpoint of national income, the transaction is no more than one of "unrealized appreciation." The two parties involved have merely traded horses. It is not denied here that there has been a gain in production or profitability from the viewpoint of the two parties combined; but it is contended that the measuring device used is not applicable. Eliminate the interstitial transfers in the social economy and virtually all money income is canceled. The income of the entire social economy thus becomes mere conjecture.

Accounting fills a useful function when applied to a given small segment of a much larger unit of economy. But if the size of such a segment becomes a significant portion of the whole, the recognized procedures and even the accounting concepts tend to lose significance. Accounting income is based ultimately upon transactions with outsiders. In a completely self-contained economy, such as the people of a



nation without foreign trade, there are no outsiders. Just as a man cannot make an accounting profit by trading with himself, so the people of a nation cannot make a social income so long as their transactions are all with each other. In a national economy the instrument of measurement, the external transaction (money used in exchange rather than money as a measure of value), is lost or becomes inapplicable.

The social economist often relies on a definition of income in terms of satisfaction and this constitutes income in the most fundamental sense. This concept is difficult if not impossible of measurement. However, the individual may exercise a choice in alternative wants to be satisfied, or he may choose between means of satisfying the same want. These buyers' choices are determining factors in establishing market prices, and such choices as registered in a market create an accounting transaction. But no accounting procedure or device comparable with that used by firms which produce and sell has been developed for use in a national or total economy. This may be explained perhaps in part by the fact that the problems of a national economy have not been the subject of so much attention as have those of the individual firm.

There are other economic and enterprise accounting concepts which differ and are often confused. The accounting concept of cost is not identical with the social concept of cost, and failure to make proper distinctions will lead to serious errors in attempting to reason from one set of concepts to the other. Accounting costs are based on the payment or promise of money to a party external to the enterprise. These costs are measured in transactions. From a social point of view that which is for one party the payment of a cost (via the liability route referring to technical double entry accounting procedure) is the receipt of revenue or income in like amount for

the other party. Hence money cost seems to have no substance from a general or social point of view. The payment is not a cost at all but merely a transfer of funds between individuals and works no measurable change in the total. The transaction is an indispensable instrument of measurement and an ultimate check on the total of any cost to an individual firm, but this device appears useless as a criterion of social cost.

Real social cost must be measured in terms of valuable resources lost or in some way used up. As in enterprise accounting, the cost or surrender of resources is directed toward the end of gaining something more desirable. But in the case of social cost what other element is the measuring device? It is understandable that in giving an account of social cost resort is often made to physical units lost or consumed. Yet cost from either point of view must be a value concept rather than a physical one. Any consumption or shrinkage must be interpreted in value terms instead of in physical units if it is to be relevant to the problem of the economy. The practice of expressing social costs in physical units is truthful so far as it goes, and it may be more adequate than the arithmetical sum of individual costs as measured by transactions in which money is involved; but this method merely shifts the valuation problem to the user of the data. How can the one who uses the data in the viewpoint of social cost be certain he rates the significance of the physical units correctly? There may be no valid alternative to the practice of stating these "costs" in physical units, but the practice avoids coming to grips with the fundamental economic question. The difference it makes is that unless physical and intangible resources lost or consumed are correctly valued, the extent of the loss so far as the economy is concerned is not known. Without valuations there can be no economy.

Social costs must be conceived of as opportunity costs. An opportunity cost is a resource which is necessarily surrendered in the process of acquiring something else. This can be clarified by use of a simple example. If an acre of land is devoted to growing wheat, the true cost of the wheat grown, assuming that all other factors are equal, is the oats or other crop which the land would have produced if it had not been devoted to growing wheat. Again, opportunity costs are difficult if not impossible to measure. The exercise of one choice precludes the exercise of another, the results of which cannot be known for certain. The measurement or comparison of alternatives, however, is a valuation process and, in fact, such valuations or comparisons are made and must continue to be made whether accurate or not. In every business decision, different courses of action and different resources of use are compared and a judgment is made as to which is the better alternative. The economical choice is that which yields a return in satisfaction to an individual (in the case of a consumer's choice), or in money income (in the case of an enterprise producing for a market), in excess of, say the second most promising alternative. In terms of double-entry accounting this is equivalent to a comparison of actual revenue with that which would have been received as an alternative—both items of comparison being credits in a ledger in which debits can be matched with only one of them. Thus, in some respects, accounting has severe limitations for the determination of economic choices. Perhaps accountants who wish to restrict the use of accounting to its traditional services are right.

Cost, just as income, has no meaning except in relation to someone's point of view. This repeats the belief that economy is meaningless except from a designated point of view. Either a cost or an economy

in the abstract is impossible. Hence the question may arise whether there can be a definitely national or social economy. What is economical for a country as a whole? This question can be answered only if the various individuals of a society in question are in substantial agreement concerning the relative importance of different wants to be satisfied and if there are adequate means of expressing this state of affairs. There is little use in attempting to compare or to offset one individual's preference or choice, satisfaction or dissatisfaction, against that of another, and thus to arrive at an arithmetical sum for the whole. Economic theorists have long been aware of this, yet in discussions of policies which could alter the size of the total income of nationals or involve a different distribution of the total, this admitted condition is usually forgotten by policymakers and voters alike.

In few modern nations, and least of all in the democracies in which people have become accustomed to a great deal of individual freedom, is there likely to be the degree of general agreement over the merits of different persons' wants which an observer with limited experience might be led to expect. But, in any event, the practical answer to the question of national economy requires a comparison of satisfying the wants of one man with satisfying those of another when there is no common yardstick for the comparison of one man's satisfaction or dissatisfaction with that of another. Policies which give most to some people at the expense of others may find no solution in economics. Justification for raising one man's share of the national income or social product at the expense of another may lie largely outside this field. But even in the most completely democratic country some scale of values, possibly of a noneconomic nature, must be assumed by the policymakers before any answer can be given to

questions of governmental economic policy. In some countries the criterion might assume that all men are intrinsically equal and therefore all are entitled to an equal income. But the possible "diseconomy" of such a state of affairs should be evident.

Another criterion could be equal income for equal productive contributions. We shall not attempt to complete the possible list. But the productivity criterion is in even more danger than formerly has been the case of becoming a mere slogan because of the impossibility of measuring productive contributions. Even if the theory of marginal productivity has important applications at times, as a measure of an individual's wages or other income it is becoming less useful than it formerly may have been. More and more modern products are the result of joint use of productive factors. The contribution of no single factor is directly determinable. The concept of marginality still has applications in certain firms by way of fixed and variable factors, but neither labor nor any other factor per se can be considered a variable factor, even if labor unions are left out of account. A certain laborer or group of laborers may be such an integral part of the total organization that the proportions of factors cannot be altered at all. For example, the alternatives may be either to operate a plant at near full capacity with a full crew and a man at every specialized task or to close down production altogether.

With greater specialization of tasks, more complex organization of productive units, and the use of joint facilities, the theory of marginal productivity becomes less applicable as a guide in measuring productivity and hence as a basis for sharing in the rewards of industry. Modern production is becoming increasingly the result of an almost endless variety of different types of labor and other factors which cooperate jointly to produce a single prod-

uct. Marginal analysis in terms of over-generalized factors offers little or no help in the distribution problem. Accordingly, it is not surprising that the bargaining theory of wages is in its ascendancy. And it may not soon encounter limitations set by the productivity theory. The bargaining theory (of wages or any income), which implies, concomitantly, cost to some and income to others, may be expected to gain in recognition and receive a wider acceptance, whereas the appeal to the productivity theory may be expected to lose force. This does not deny that between larger areas the concepts of marginality and competition are not both applicable and desirable.

Social costs sometimes include items which are excluded from accounting costs. A firm may hire men for a monetary wage that is either more or less than the sum required to maintain the health of the employed, the dependent members of their families, and the perpetuation of the race. All these are social costs. Formerly, productive commercial enterprises did nothing in recognition of the social cost of accidents, occupational diseases, etc., but at present a great deal has been done to change this situation. Now such social costs are often laid upon industry and, through prices, upon ultimate consumers of the product.

Accounting cost cannot be in agreement with social cost unless all resources used and accounted for are valued correctly from the social and the very long-run view. For example, timber in early American history was depleted with profit to the firm which exploited this natural resource. Many other similar illustrations could be mentioned. The results under present enterprise accounting might have been substantially correct if the original resources had been valued correctly in view of historical developments. Market forces, especially under free competition, do tend to

place correct values on all resources, but they do so currently or only in the medium short run.

Timber tracts of 1850 or the oil reserves of today may have been valued correctly in terms of current conditions, but the course of only a short history shows the timber to have been greatly undervalued socially. The same might be true of other limited and irreplaceable resources. But in valuing such irreplaceable resources it must be recognized that there is no definite method of determining how far into the future the period should extend over which the use of such resources should be allocated. We may wastefully exploit oil or gas at a low unit-accounting cost during the next ten years, or the next twenty-five years, or the next hundred. Who can tell what length of fiscal period would be the most economical socially to cover the depletion of irreplaceable resources? The enterprise view offers but a minor problem in comparison with the social problem. The correct period chosen from a social viewpoint for the purpose of discounting expected services from an irreplaceable natural resource is such an imponderable that the answer can be only arbitrary; yet the answer which must be given affects directly the accounting as well as the social cost. Related also to the correct valuation and allocation in time of the use of present resources is the question of developing substitutes and new resources. It cannot be determined whether and when these substitutes will be physically available or available at money costs as low as that of the original resource. The availability of substitutes often is mere speculation. In conserving the wasting and irreplaceable resources, estimates must be made; but many unknown factors both favorable and unfavorable are always present and must be taken into consideration.

#### CONCLUSIONS

Accounting and social economics deal with concepts which may be somewhat alike, but are not much alike. Some use of common terms has tended to confuse important differences. The differences are generally more impressive than the similarities. Both deal with the concepts of value of property and income and hence of economy in some sense. The accountant, who works in a predominantly competitive economy, has access to techniques of measurement which are not equally available to the social economist. Great danger arises from the assumption that one can go from specific concepts used by the accountant of a firm to similar concepts for a total economy.

Property value in any form which can be liquidated, i.e., converted in a market, has definite significance to the individual owner or firm. Productivity in any sense other than enhancement in marketable value has little significance for the individual or firm. On enhancement of market value depends his or the firm's money income. In a social economy only the creation of a consumable product is productive. This is true if we designate as production the creation of assets to be used in subsequent production and then adjust for double counting.

The accountant recognizes "appreciation" whenever converted by means of a business transaction to a different form (such as cash). The transaction device is basic to nearly everything the accountant does. Yet from the standpoint of a total economy the transaction is either artificial or has significance not relevant to the accountant's problem. The transaction in a total economy is a means merely of creating ownership increments of value as compared with other forms of "utility," but not a means of measuring productivity.



Since from the viewpoint of a total economy every sale is matched by a purchase and every cost or outpayment is matched by a receipt or inpayment, it should be clear that the attempt to apply familiar accounting techniques to similar problems with regard to national income will be grossly misleading.

The accounting concept of cost will not suffice for the economist any more than the accounting concept of income will suffice. Accounting cost is basically reducible to a money payment. But from the viewpoint of the total economy this payment is revenue and a basis for money income as well as a basis for cost. And the payment and the receipt are always equal.

The accountant, who represents the viewpoint of a particular enterprise, has gone far in developing adequate basic concepts of analysis; he has also outstripped the economist as regards techniques of measurement. Relevant concepts and techniques of measurement must be mutually consistent or even inseparable parts of one whole. Economists can hardly assert that their concept of national in-

come is significant unless the concept can be measured. Volumes have been written on the subject of national income while taking it for granted that measurement is merely a matter of working out a few subordinate details. Often an economist assumes that an accountant who also has some mastery of present economic theory can do the measuring task. This is far from the truth. With so much interest in the question of national income it is well to hesitate until more adequate ponderable concepts are formulated. Otherwise national income is likely to be only a catchword which impels action in favor of this or that pressure group although it offers no real solution to economic ills.

Accounting alone rarely supplies management with the required knowledge for allocating the resources of a firm in the most desirable manner. Nor does it aid the individual much in making the wisest choices in consumption. Can any accounting techniques be relied upon to assist greatly in the tremendous problem of allocating the total resources of a relatively large exchange economy?

## ACCOUNTING FOR THE DAIRY PRODUCTS INDUSTRY

ROBERT S. COOPER

**N**ATURE has endowed the simple bovine with great qualities. The application of these qualities to mankind's vital needs is the cause of many severe headaches.

Twenty-five years ago the milk from a cow would arrive at the consumer's doorstep about twelve hours (sometimes three or four hours) after milking time. Today this interval is much longer. The entrepreneur plays a much larger part in the dairy business than formerly. In fact, the processing distributor is almost a monopo-

list in the large metropolitan areas.

It is estimated that sales of fluid milk in Baltimore are 98½ per cent pasteurized and 1½ per cent raw milk. The bringing of raw milk from western Maryland, and even from Pennsylvania, to Baltimore, and subsequent pasteurization and distribution present many problems of operation. In ensuing paragraphs I will endeavor to show how the raw product is accounted for the whole way from the farm to the consumer's doorstep.

It should be stated that accounting



technique in the dairy industry has kept pace with technological advances and the transition from the horse and wagon to the paneled milk truck. In the heyday of the farmer-distributor no complicated accounting problems were encountered. Monthly receipts could be set off against comparatively few expense items. The farmer did not think in terms of depreciation, reserves for bad debts, or obsolescence.

Accounting was confined to the simple problem of income and outgo. Regulations were few and licenses were nil. In 1920, about twenty-five small dairies served the city of Annapolis, population 10,000, and the dairymen would often take their competitors' bottles. These were generally unmarked, and one dairy could use another's containers. There were no such things as dated caps, standard butterfats, or homogenized milk in the commercial sense.

Milk sold from fifteen to eighteen cents a quart during World War I, and at those prices few dairies made money. It may reasonably be asked how the large distributor makes money today at eleven to thirteen cents a quart.

The answer is that the dairies do not make much money at that price. Several years ago one of the two large nationwide dairy companies said that its profit on milk sales was less than one per cent, or about one-tenth of a cent a quart. Under such circumstances, it is obvious that extremely careful accounting control must be maintained to enable the dairy to make a profit. Inasmuch as it is no secret that the farmer obtains from five to six cents a quart for his milk, the layman may wonder why the distributor makes such a small profit when the spread between the purchase price of raw milk and the pasteurized product is six to seven cents a quart.

No attempt will be made to give detailed percentage figures of operating re-

ceipts and costs, but a résumé of accounting problems on ensuing pages should indicate that neither the farmer-producer nor the dealer-distributor is making an excessive profit at the expense of the consumer.

Except for pasteurization and bottling, raw milk does not change form after milking. Aluminum goes through many processes before it reaches the shape of a cooking utensil. Retail milk sells from five to seven cents a pound whereas aluminum reaches the housewife at a price of close to sixty cents a pound. It will be argued that a daily commodity costing six cents a pound is far more expensive than a kitchen utensil costing ten times as much and which may be used for months, even years.

#### CHART OF ACCOUNTS

Each dairy has its own problems and peculiarities. There are no hard and fast rules that govern dairy accounting, but the principles for the major dairies are the same.

There are three main divisions of expense; all are very closely related, but each is so vitally important that separate treatment here is necessary to enable the reader to understand clearly the ramifications of the dairy industry.

These three divisions of expense are as follows:

- Milk production
- Milk containers
- Milk distribution

The items of expense which make up each division will vary in different dairies because the class of business engaged in will vary. Systems of internal control are planned according to the needs of a company. Some organizations have relatively little book work, but maintain close scrutiny over the drivers through the route foreman.

However, there are certain important records which will be maintained by every well-run dairy. Although they may

not appear on the general books, these records are of vital importance in enabling the management to determine the efficiency of operations.

#### MILK PRODUCTION

As in every manufacturing enterprise, the first step of operations is production. The following chart indicates the items of expense which will be found in a typical dairy.

#### CHART OF PRODUCTION EXPENSES

##### Cost of goods sold

##### *Cost of material*

- Raw milk
- Cream
- Sour cream
- Cottage cheese
- Choc-au-lait
- Orangeade
- Butter
- Bakery
- Eggs

##### *Production expense*

- Direct wages
- Bottle caps
- Ice
- Repairs to machinery
- Depreciation on milk machinery
- Laboratory expense
- Licenses
- Cleansers
- Uniforms and laundry
- Power
- Auto expense
- Miscellaneous
- Cans washed (credit)
- Hauling (credit)

##### Total Cost of Goods Sold

The largest single item of expense will be the cost of raw milk and other products sold. How is the product accounted for?

Milk is obtained in three ways. It is brought in by the dairy from many farms, individual farmers bring in their own milk, or a trucking concern delivers it, charging the shipper so much a gallon for delivery.

Control of incoming milk is highly important. Each shipper has tags on his milk

cans. When they are received on the platform, the temperature of the milk is taken and each can is weighed. A record is made on the tag of the weight and temperature. Each day the daily receipts are posted on a long sheet which bears the names of all the shippers and has columns for cans, gallons, pounds, temperature and space for remarks.

Some dairies will pay on a gallonage basis. However, most of the large associations compute farmers' checks on a poundage basis. Temperature is important; from this record the production department knows whether to visit farms to check on cooling methods and to take necessary steps to see that proper temperatures are maintained. The number of cans is important because this figure is needed by the accounting department to determine how much to deduct from the farmer's check for can-washing. Similarly, the remarks column is necessary. Information in this column is transferred to the shipper's own settlement sheet.

Throughout the years an intricate system of production and price control has been established. In Baltimore most of the leading producers purchase milk through the Maryland Milk Producers Cooperative, Inc. This cooperative is the intermediary between the distributor and the farmer. An individual farmer will have a basic allocation: so much first-class milk at top price, so much for second-class (usually a fixed percentage of first-class milk), and the rest at a surplus price.

Milk is paid for on a butterfat basis. The farmer who delivers 4.5 per cent butterfat milk will receive more than the shipper with 3.8 per cent milk.

Who establishes the butterfat content? Obviously, neither the farmer nor the distributor, although each can make his own tests. As a matter of fact the distributor usually makes daily laboratory tests for his satisfaction, but it is the usual practice for

an independent dairy laboratory to take samples of each farmer's milk. This may be done three or more times a month. The dairy laboratory will take an average of these tests which it will furnish to the dealer to use as a basis for paying the farmer.

There are different types of settlement sheets, but a sample of one in use is shown below.

At the end of the month the total pounds on the thirty-one daily receipt sheets are checked to see that they agree with the totals on the individual shippers' sheets.

An original and a duplicate of the settlement sheets are made. The original goes to the farmer with his check, and the copy is kept for office records. The farmer can check his sheet against daily deliveries to establish the correctness of the distributor's calculations. Likewise, he can look in the remarks column and see how much has been deducted for cleansers, parchment paper can seals, or other supplies bought from

the dairy. He can check butterfat tests from copies of the dairy laboratory's tests on file with the local dairymen's association or cooperative.

The dealer pays the farmer once a month, usually on the fifteenth of the month, for all milk purchased during the preceding calendar month.

The office copies of the shippers' sheets are summarized, and a journal entry is made as follows:

dr.	Milk production
	Milk purchased (cost ledger)
cr.	Milk production
	Hauling (cost ledger)
	Cans washed (cost ledger)
	Due to shippers
	Due to association
	Advances for freight, new equipment, etc.

Deductions for hauling and cans washed serve to reduce total cost of milk production. Cleansers, parchment paper, etc., are sold to farmers at cost, and appropriate

#### HAPPY COWS DAIRY—SETTLEMENT SHEET

In account with—T.Q. Wells				For Standard Milk		Month Ending—May 31, 1941	
Date	Manifested	No. of Cans Returned Unfit for Use	Received	Pounds	Freight on Return Milk	Freight Advanced	Remarks
1							
2							
3 to 31, incl.							
Total pounds.....					Butterfat Test %	Price Per CWT.	Amount
Total 1st class pounds.....					3.8	\$3.30	
2nd class pounds.....					3.8	1.90	
3rd class pounds.....					3.8	1.60	
						Total.....\$	
DEDUCTIONS							
Cans washed.....							
Association dues.....							
Hauling charges.....							
Cow test.....							
New equipment.....							
Freight on new equipment.....							
Cash advanced.....							
Total deductions.....							
AMOUNT OF CHECK.....							\$

credit entries are made to inventory accounts for these supplies.

When the shippers and association dues are paid, the appropriate accounts are charged in the voucher record.

#### PRODUCTION REPORT

It is a relatively easy matter to account for milk purchased. The problem is to account for the milk after it has gone through the plant. The management wants to know how efficient the plant is in handling the commodity. Unlike iron ore, wheat, or other raw materials, milk cannot be stored for months. From the plant standpoint, milk must be used every day, seven days a week.

Instead of thinking in terms of gallons of milk, pints of cream, or pounds of butter, at the plant "units" are used. The standard unit is one quart of milk. Unit values are established for other products: ten units to a quart of 40 per cent cream, five units to a pound of butter, five units to a quart of 20 per cent cream, etc.

Each day the raw milk is received it is converted into units on a plant production report and, after the day's run of milk is made, the resulting output is converted into units and compared with receipts. At the end of the month the production report is summarized and checked by the accounting department to determine the efficiency of the plant. This might be summarized as follows:

RECEIPTS	Units
55,000 gallons.....	220,000
PRODUCTION	
120,000 quarts milk.....	120,000
10,000 pints milk.....	5,000
60,000 half pints milk.....	15,000
20,000 quarts choc-au-lait.....	20,000
40,000 half pints choc-au-lait.....	10,000
2,000 pounds butter.....	10,000
20,000 half pints table (20%) cream.....	25,000
5,000 half pints (40%) cream.....	12,500
Total output.....	217,500
Plant loss.....	<u>2,500</u>

Although no formal record is made on the general books, this figure is the first one the management will want after the first of the month. If kept accurately it is an important aid to the production manager in keeping plant losses to a minimum.

When the milk is turned over to the platform, the production department obtains a receipt. These output receipts are totaled at the end of the month and converted into units in order to compute plant shortage. Obviously total plant production less output to the platform should equal closing inventory. The difference between book inventory and physical inventory represents plant loss.

#### MILK CONTAINERS

The second important item in the milk industry is container expense. Although it is overshadowed by both milk production and milk distribution, it is the least controllable item of expense. As a matter of fact, most dairies account for bottle expense on a combined physical- and book-inventory basis.

The question of containers is very well summed up in the following paragraphs:

"Milk bottles, bread baskets, ice cream containers, barrels of all kinds, boxes, kegs, and sacks are examples of containers which are used in many industries almost exclusively in the distribution of their products. One organization will classify boxes, barrels, and bottles as a fixed asset and establish a depreciation reserve for recovering their cost. Another organization, using the same type of container in the distribution of its products, will charge the cost of these items to operating expenses and carry the inventory on hand at the end of the accounting period as a deferred item in a packing supplies account. . . .

"However, some containers, such as milk bottles, are returnable at the option of the customer. No charge is made the customer for the bottle, but it is customary on the part of the purchaser to exchange an empty bottle for a filled one when the dairyman makes his daily call. Again, if the milk is purchased at a retail outlet, the retailer finds it necessary to charge the customer for the container, the return of which will obligate the merchant to refund the amount

charged for the bottle. This is also true of soft drink bottles. . . .

"The valuation of the containers account also presents a difficult problem. For example, it is almost impossible to take a physical inventory of the asset account in the retail milk industry. Although the bottles remaining in the inventory supply room can be easily determined, counting the number of returnable bottles in the hands of customers is impractical. As a result, the inventory costs of containers in the hands of the customers and likely to be returned are estimated. This method of estimating inventory costs is based on past experience and good judgment. A liberal allowance for depreciation and losses must must always be taken into account."<sup>1</sup>

The actual method of computing bottle inventory by a number of dairies is as follows:

Empty bottles in store room.....	at cost
Filled bottles.....	at cost
Three times filled bottles estimated to be in customers' hands.....	at cost
Result equals bottle inventory.....	at cost

There is a fallacy in this method. If output is normal the resulting bottle expense will be fairly stable, with due allowance made for the day on which the month ends. Saturday and Sunday are notoriously poor bottle-collection days, and a month ending on either of them will result in a low bottle inventory on hand.

However, take an extreme case. A dairy normally sold 1,000 half pints of milk daily. It had 1,500 empty bottles on hand, 1,000 filled bottles, and 3,000 assumed to be in the hands of the public. This made a total inventory of 5,500 bottles. It received a contract for 10,000 half pints daily, starting on the first day of the month. Actually, it filled 10,000 half pints on the thirty-first of the month for use on the next day. Using the standard formula, it inventoried 30,000 in hands of customers, whereas it normally would have about 3,000 with customers. This is a distortion of accounting facts, and

obviously allowances should be made for such cases.

Retail customers are not charged for bottles in practice. Actually, the driver is charged for the bottle at one cent. If he delivers one hundred quarts of milk daily, his customers will be charged \$13, but he will be charged \$14 on his settlement sheet. If he turns in ninety bottles he gets ninety cents credit, and is ten cents out of pocket for lost bottles.

On the milk-sales analysis, sales are shown to include the cent deposit on bottles. However, on the drivers' control sheet all bottles returned are deducted from sales. Next, total bottles charged to drivers are added and deducted from total returns. The difference is then credited to or debited to sales as the case may be.

Let us assume results for bottle charges and returns as follows:

Total bottles charged.....	500,000-\$5,000
Total bottles returned.....	472,000- 4,720
Excess charged over returned.....	28,000-\$ 280

A journal entry will be made:

dr.	Sales milk.....	\$280.00	
cr.	Inventory bottles.....		\$280.00
	To credit inventory bottles with excess of bottles charged to routes over those returned		

Sales milk had been credited with bottle deposit in the beginning, and had been charged with \$4,720 for bottles returned, through the milk-sales analysis and drivers' control sheets. Therefore the above entry is made to eliminate from milk sales all bottles charged.

Whereas actual bottle expense is computed monthly, cans and cases are inventoried once yearly. Monthly purchases are charged to a budgeted account. Cans-and-cases expense is computed each month as a percentage of sales.

A journal entry is made:

dr.	Milk container expense	
	Cans & cases (cost ledger)	
cr.	Budgeted expense cans & cases	

<sup>1</sup> Harold G. Avery, "Accounting for Tools, Containers, Furniture and Fixtures, and Other Equipment." *Journal of Accountancy*, May, 1941, pp. 428, 429.



At the end of the year, the net debit or credit balance in the budgeted expense account is reflected as a debit or credit to milk-container expense. Similarly, the increase or decrease in inventory is reflected in an addition to or deduction from milk-container expense.

#### MILK DISTRIBUTION

Although the largest element of expense in a quart bottle is milk production, the expense of distribution is becoming increasingly important. The following comments are of interest in connection with a discussion of distribution accounting:

"The great new frontier for accounting lies in accounting for distribution costs. This field requires, however, not only an understanding of the principles of accounting but also an appreciation of the range of activities carried on for the purpose of marketing goods and services. . . ."

"The need for greater cooperation has become increasingly acute. Surveys of distribution have shown it to absorb a tremendous proportion of our total income. Already these costs far exceed the costs of manufacturing in the United States, and charges of waste and inefficiency are leveled at marketing agencies from all sides. . . ."

Milk-distribution expenses embrace all those from the platform to the consumer's doorstep. Selling expense, which is the cost of obtaining new customers, is charged to distribution expense. But distribution expense involves far more factors than selling expense.

The chart below shows items of milk-distribution expense.

#### CHART OF DISTRIBUTION EXPENSES

Direct wages  
Auto expense  
Ice  
Uniforms and laundry  
Miscellaneous  
Selling

Direct wages are the largest item of expense in milk distribution. These are the wages paid to route delivery men and route foremen, and to special-delivery drivers. The method of payment varies in different dairies, but regular route men are paid on a commission basis according to collections. The accounting department must keep an accurate record of each driver's daily transactions in order to compute his weekly pay as well as to make deductions for shortages which may occur.

In milk-distribution accounting, there are two important records which are kept by every dairy of any size. The form and content of these records may vary considerably, but they are integral and vital parts of the accounting records. These are the driver's daily "settlement" sheet, and the driver's monthly "control" sheet.

The settlement sheet is similar to a fan-fold sheet, and consists of an original and two copies carbonized so that the delivery man can make a triplicate record of his deliveries in one operation. This record is about seventeen inches wide when unfolded, eight inches wide folded. Actually, there is a three-inch extension on the third copy, this extension being used by the driver for computation of his retail and wholesale sales both in units and dollar amounts. The form referred to is widely used by a number of dairies on a so-called "pegboard." There is a row of punched holes at the top of these sheets which can be fitted over metal pegs on a metal board. Thirty of these sheets may be spread over a pegboard at one operation and, with a competent operator using a comptometer, sales broken down by different products may be figured in less than an hour for twenty to thirty routes.

There are simpler settlement sheets in use, but even more complicated ones are used in connection with tabulating machines. Tabulating machines do not have so wide an application to dairy accounting

<sup>1</sup> Donald R. Longman, "Distribution Costs—A New Frontier for Accounting," *Journal of Accountancy*, September, 1940, p. 232.

as they do to other industries, because the rental is relatively high and because of the peculiar nature of milk accounting.

Since the "pegboard" settlement sheet is widely used, a discussion of its use will at least acquaint the reader with methods of milk-delivery control.

The top sheet is the driver's requisition. The driver estimates how much milk, cream, orangeade, etc., he will deliver to his customers the next day, and puts these amounts on his settlement sheet in pencil. These figures are put in a column headed "first load."

The entire settlement sheet is turned over to the platform superintendent, who sees that cases are filled with necessary quantities for each driver by the time he leaves early in the morning. To supply extra orders, each driver tries to take a little more milk than he needs. Sometimes he takes too little, and it is necessary to return for more milk. There is a column on his requisition sheet for "second load." After his deliveries have been made he checks in all milk not used to the platform clerk. He obtains credit for this in a "return" column on his sheet. The platform clerk counts all empty bottles returned and makes a notation on the bottom of the settlement sheet. All of these entries made by the platform clerk are in triplicate.

The platform clerk then tears off the "requisition" and "load record" sheets, and turns over the "settlement" sheet part to the driver. The platform clerk keeps the requisition" copy, entering it on a platform production sheet. After he has entered all drivers' requisition sheets on the platform production sheet, the platform sheet is added. It will be remembered that earlier in the day the milk-production department turned over to the platform milk for which it obtained receipts. At the end of the day, when all deliveries have been made and when the platform production sheet has been added, a physical count of

all milk in the platform storeroom is made. The physical inventory is listed under the total platform issuance to drivers. This sheet is then sent to the accounting department.

The accounting department computes the platform shortage by adding the opening inventory to receipts from the milk-production department. It then deducts platform issuances to drivers, and arrives at a book inventory. If book-inventory figures are greater than physical inventory the platform is short. This article is not concerned with any auditing problems, but the daily production check for both the milk production department and the platform is a vital factor in determining the efficiency of these departments and also in preventing collusion between the platform and drivers, or between the plant and the platform.

The "load record" sheet referred to above is used by the accounting department in checking entries by the platform clerk to the platform report. Entries made in entering to the platform sheet from the "requisition" sheet are corrected.

After the driver has checked in he fills out his "settlement" sheet. Attached to the unit-delivery record of the settlement sheet is a narrow strip entitled "sales." Here the total units sold are broken down into "wholesale" and "retail" units. The driver multiplies the number of units by unit prices to obtain dollar sales for each item. These individual dollar sales are added to find dollar sales for the day. The total figure is placed at the bottom of the report.

On the reverse side of the report there is a printed form for the driver's cash turned in, and for a record of his daily settlement. The cash turn-in section consists of lines ruler' off on which the driver lists his checks, bills, half-dollars, quarters, dimes, nickels, and pennies. He adds his total cash and enters the figure on the bottom line.

In a section below, headed "daily settlement," the driver makes a recapitulation of his daily transactions. This section would appear on a typical report as follows:

DEBITS	
Opening balance.....	\$1,100
Total sales today (see other side).....	95
Transfers from route No. 9.....	3
Total debits.....	\$1,198
CREDITS	
Cash turned in.....	\$ 75
Authorized allowances (Mrs. Jones).....	1
Transfers to route No. 6.....	2
Wholesale allowances.....	6
Other credits.....	4
Total credits.....	\$ 88
Closing balance.....	<u>\$1,110</u>

A word of explanation is in order regarding each item. The opening balance is the theoretical balance of all customers' accounts in the driver's book. Total sales is the sum shown on the front part of the settlement sheet. These sales are posted to customers' accounts. Transfers result when a customer on another route moves to the territory served by the driver. The balance on the former route is transferred.

With respect to credits, no explanation is needed regarding cash turned in. Authorized allowances are usually made for customers' complaints: milk not received, sour cream, etc. Transfers to another route result from a customer's leaving the territory served by the driver. Wholesale allowances are special discounts to quantity purchasers. Other credits are for bottles returned.

Closing balance is the theoretical balance of all customers' accounts at the end of the day. As a practical fact, the balance of customers' accounts in the book seldom agrees with the balance on the settlement sheet. The driver is either "short" or "over." If his book is "short," that is, the balances of customers' accounts are less than the figure on the control sheet, an amount necessary to balance this shortage

is taken from the driver's pay, and is credited against the balance of accounts on the "settlement sheet."

The shortage or overage is ascertained by running an adding machine tape of all balances in the driver's book once a week, and comparing with the control balance on the settlement sheet as of that day. The shortage may be computed any day in the week, and it is customary for a tape to be taken when a relief driver goes on the route so that he may be held accountable for any shortage occurring when he is serving the route.

The driver's settlement sheets are checked by the accounting department. A clerk takes all the settlement sheets for each day, adds all unit sales for each commodity, and computes the dollar sales for each commodity. Similarly, the totals for all routes are entered on a monthly "sales analysis" record each day. At the end of the month the units are all added and multiplied by unit values, and total sales for the month are computed.

Reference has been made to the driver's control sheet. This is simply a monthly recapitulation of all the daily settlement sheets. Each day the transactions recorded on the back of the settlement sheet are posted to a control sheet for each route. At the end of the month, all of the columns in the control sheet are added. The routes are then listed on a master control sheet. The results of this sheet are added, and the final figures will show the balance of accounts at the beginning of the month, total sales charged to routes for the month and other charges, total credits for cash and allowances, and closing balances of customers' accounts.

#### SUMMARY

Space does not permit discussion of the many idiosyncrasies developed in accounting for milk production and distribution. It is sufficient to say that accurate records

must be maintained not only for guidance of dairy officials, but for health department authorities, Federal government agencies, and for farmers' associations.

There are service departments in the dairy industry whose activities are integrated with those of the main operating departments. These are power, selling, auto and truck, credit and collection, and general administrative expenses. It has been mentioned that selling is a part of milk distribution. Auto and truck expenses are kept separately, and prorated to milk production, milk distribution, selling, collection, and general administrative functions.

The amount of credit and collection effort will depend largely upon the territory and character of customers served. Likewise, general administrative expenses will show a great variance. Some dairies will have a great deal of bookwork due to the nature of business conducted. On the other hand, there are dairies which cater solely to retail trade, have virtually no "special deliveries," and do not have any cut prices. Their accounting records are held to a minimum.

Accounting detail grows in proportion to

the amount of wholesale business served: e.g., chain stores, hamburger stands, government reservations, large cafeterias, schools, etc., which require special bills.

It is not possible, therefore, to discuss in general terms accounting for the service departments of the dairy industry.

Accounting for depreciation of equipment, machinery, and trucks likewise is a topic about which a separate article could be written. There is one thing certain about depreciation accounting in the dairy industry: It is seldom too conservative. Obsolescence of equipment and machinery is a factor which holds dairy profits to a minimum.

The milk industry is subject to as many whims of the human mind as the silk-stocking trade. Dacro caps, cellophane hoods, welded wire seals, cream-top bottles, light-weight bottles, and paper containers are innovations of the last decade. They are primarily "business getters," and, frankly, have had little to do with improving the quality of the products.

It can be truthfully said about accounting for the dairy industry that although the hours are long and the toil sometimes irksome, there is never a dull moment.

**Important announcement inside back cover.**

## ORIGINAL COST AS A RATE BASE\*

JAMES C. BONBRIGHT

- Q. Are you generally familiar with the issues in the present case and with the record so far made before this Commission?
- A. Yes, I have given much study to the present case, and to the problems of rate-making which it involves, as well as to the general status of the Company as revealed in the record. I have not had an opportunity to read the entire record, but I have read many portions and studied many of the exhibits.
- Q. Specifically, have you read and studied the portions of the record in this case relating to the amount which the Company in its original cost study has classified in Account 100.5 and relating to the financial history of the Company and its predecessors prior to 1911?
- A. Yes, I have read the Commission's opinion in the general rate case, decided in 1913, as well as its later opinion in the 1923 case. I have read from People's Counsel Exhibit No. 1 the Company's explanation of the amount which it has classified in its original cost study in Account 100.5. I have read the recent annual reports of the Company to its stockholders. I have read and studied the testimony given by Mr. Holland, and the exhibits which were offered in evidence during the course of that testimony, relative to the amount of capital investment.
- Q. Specifically, People's Counsel Exhibit No. 11 and Mr. Wagner's letter to the Public Service Commission, dated December 12, 1911?
- A. Yes, as well as People's Counsel Exhibit No. 13; also Consolidated Company Exhibits Nos. 82 and 83, which the Company filed in the 1911 case and which I understand were incorporated by reference as part of the present record.
- Q. I believe you have also read the testimony of Dr. Paton?
- A. Yes.
- Q. As a result of your study of this case, are you now prepared to express an opinion, from the standpoint of a specialist in public utility economics, as to what would constitute a reasonable rate base to be used in the determination of the Consolidated Company's electric rates? In asking this question, I would like to make it plain I am calling for no expression of opinion on the peculiar statute law of Maryland since that is a point to be argued by lawyers and not by expert witnesses. Instead, the question calls for an opinion on a sound rate base from the standpoint of the economics of public utility regulation and under the assumption that the Maryland law would permit the Commission to adopt such a rate base.
- A. Yes, I have reached an opinion as to the general nature or measure of such a rate base, although not as to the precise figure in terms of dollars.
- Q. What, then, in your opinion, would constitute an appropriate measure of this rate base?
- A. Broadly speaking, in my opinion, the rate base should be measured by the recorded or estimated original cost of the electrical utility properties minus a reasonable deduction for depreciation and plus whatever is an appropriate al-

\* Part of the direct testimony of Professor James C. Bonbright before the Public Service Commission of Maryland, on April 3, 1945, in a case involving the rates of Consolidated Gas, Electric Light & Power Company of Baltimore, taken from the public record of the Commission.



lowance for working capital, including materials and supplies.

Q. Are you aware of a contention that the book figures of the Company's utility plant and equipment are materially in excess of original cost?

A. Yes, I understand that there is a claimed excess of some \$20,000,000 with respect to the entire utility properties, of which somewhat over \$7,000,000 is ascribed to the electric properties.

Q. To the extent that the Company's present book figures are found to exceed original costs, do you believe this excess should be included in the rate base, in whole or in part?

A. No—with one qualification. If any part of the excess could be shown to constitute a valid item in the acquisition adjustment account, there would then arise a serious question as to the proper treatment of such an item for rate-making purposes. However, so far as I can judge from the relevant portions of the record in this case, any excess in the Company's book figures over the original costs of its utility properties is not of this character.

Q. In supporting the use of original cost as the primary measure of the Company's rate base, are you accepting the so-called prudent investment principle of rate-making?

A. Yes, although, in this instance, I doubt whether the acceptance of a rate base derived from original cost is inconsistent with the alternative "fair value" principle as construed under the tradition of *Smyth v. Ames*.

Q. Let me return later to the question whether in this instance the use of original cost can be accepted as a measure of fair value in the traditional sense of *Smyth v. Ames*. First, however, will you please explain the role that you assign to original cost under the "prudent investment" principle? I ask you this

question particularly because some people have argued that, under the "prudent investment" principle, the relevant cost is the actual cost to the present accounting company, even when this company has acquired its properties at a price in excess of original construction cost.

A. The role of original cost, when applied under the "prudent investment" principle, is to be found in the basic nature of this latter principle as distinguished from the so-called "fair value" standard. The "fair value" standard undertakes to make the rate base depend on the value of the utility property at the time when the rates are being fixed, however much this value may deviate either from original construction cost or from actual cost to the present owner. The "prudent investment" standard, on the other hand, uses as its criterion not the value but rather the cost of the property devoted to the public service so long as this cost may be deemed to have been prudently incurred.

Ordinarily, the relevant cost is the cost of constructing the properties used and useful in the public service, and this cost, save in a somewhat unusual case, means the same thing as the cost of the property when first devoted to the public service so long as this cost may be deemed to have been prudently incurred. In recent years, however, the point has been argued by public utility spokesmen and by some other writers that, whenever the property in question has been transferred to another company at a price in excess of the original cost of the assets, this higher resale price should be substituted for original cost as the measure of the rate base under the "prudent investment" standard. The argument for the acceptance of the later transfer price as a substitute for original cost is made to rest

partly on assumed principles of orthodox accounting and partly on the ground that the rates of the present company should be regulated by reference to the costs incurred by this very company rather than by reference to the costs incurred by some previous company.

The fallacy of this argument in favor of a rate base measured not by original cost but by subsequent purchase price should be apparent to anyone who understands the basic philosophy of the "prudent investment" standard. Under this standard, consumers of public utility service compensate investors for building the plants, not just for buying them from other persons who have already built them and who have already ready devoted them to the public service. Once these utility properties have been built and have been put into public service, investors who buy them later from their original owners are simply taking over these former owners' claims to a return on the capital devoted to the public service.

We have here essentially the same situation that applies when an investor buys in the open market some shares of stock in a public utility company. Such an investor may have bought this stock at a very low price, on the one hand, or at a very high price, on the other hand. In either case, moreover, the price that he paid may have been a rational or reasonable price in the light of then current expectations of earnings and dividends. Yet, this investor could hardly adduce the high price that he may have paid for his stock as an argument for public utility rates designed to make the stock worth what he paid for it. On the other hand, a group of consumers would hardly be allowed to establish the low price which a stockholder paid for his stock

in support of a low rate base.

The very nature of rate regulation precludes the adoption of the transfer price of a utility property, presented under the guise of actual cost to the present accounting company, as a proper measure of the rate base. This is so because public utility properties are necessarily bought and sold at prices reflecting the expectations of the buyers and sellers as to what the properties can be made to earn in the future. That is to say, utility enterprises, like other business enterprises, are sold and necessarily sold on the basis of capitalized expected earning power. But capitalized earning power is the very thing which the Supreme Court and other courts have naturally and properly ruled out as a measure of a reasonable rate base even under the so-called "fair value" principle of rate-making.

The unfairness—not to say the absurdity—of a rate base measured by the resale or transfer price of a utility plant rather than by the original construction cost of this plant has nowhere been better expressed than by Judge Learned Hand, speaking for the Circuit Court of Appeals, Second Judicial Circuit, in *The Niagara Falls Power Co. v. Federal Power Comm.*, 137 Fed. 2nd, 787. With the permission of the Commission, I should like to quote several sentences from Judge Hand's opinion, not as setting any law in the case because I am not concerned with the legal aspects, but merely because Judge Hand expresses the economic point that I have in mind more clearly than I could do it myself. Judge Hand said that, if the rate base were to be measured by the purchase price to the present owner, "the builder who does not sell is confined for his base to his original cost; he who sells can assure the buyer that he may use as a base what-

ever he pays in good faith. If the builder can persuade the buyer to pay more than the original cost, the difference becomes part of the base and the public must pay rates computed upon the excess. Surely this is a most undesirable distinction."

Now, I conclude that, despite all attempts to ridicule an original-cost rate base by calling it "aboriginal cost," or other funny names, such a rate base is required as a general rule by the logic of the prudent investment principle. I know that some critics of the original-cost standard have cited Justice Brandeis as supporting the alternative standard of actual cost to the present accounting company. However, on a careful re-reading of Justice Brandeis' famous concurring opinion in the Southwestern Bell Telephone case, in which he expressed his support for a prudent investment standard, I find no grounds for an argument that the Justice was here identifying this principle with transfer price to the present company rather than with original cost. On the contrary, the Justice used language which seemed to me pretty clearly to indicate that he was thinking about original construction cost.

Q. Do you mean to imply that under the "prudent investment" principle, no account should ever be taken of a purchase in excess of original cost?

A. No, I do not. My preceding statement in support of original cost as the measure of the rate base is subject to one important qualification or exception. This exception applies to situations where a utility property has been acquired by new owners as a necessary step in improving the public service, by making a better, more efficient unit through the combination of existing utility properties. In such a case, if the new owner was compelled to pay more

than original cost in order to accomplish this socially desirable objective, and if the public benefit resulting from the acquisition of the property is more than enough to offset the public burden of the higher rate base, the inclusion in the rate base of the necessary purchase price seems to me to be in harmony with the "prudent investment" principle. Even here, however, in my opinion, the excess price should be amortized over a reasonable period of time instead of being allowed to stand as a perpetual burden on the rate payers.

The qualification that I have just noted should not be allowed, however, to become an excuse for the routine inclusion in the rate base of whatever price may have been paid for utility property by its present corporate owner. There are at least three prerequisites of the allowance of the excess price in order to satisfy reasonable requirements that the acquisition adjustment item should be included in the rate base. There must be adequate evidence: first, that the present owner was obliged to pay this excess price in order to get the property (This calls for a price on an arm's-length transaction basis); second, that this price was paid in cash, or if not in cash then in property or securities valued strictly at their cash value; and third, that the payment of the excess price was warranted from the public standpoint, and not merely from the standpoint of a good business transaction as between buyer and seller.

Q. Would this qualification that you have just made to the original-cost measure of the rate base justify the inclusion in the rate base of any book values arising merely from a balance-sheet write-up in the nature of unrealized appreciation of asset values?

A. Oh, no. Such write-ups do not repre-

sent cost in any sense of the word. They are properly excluded from the rate base without regard to the question whether the relevant cost is original construction cost or subsequent purchase price.

Q. Are you familiar with the various consolidations of predecessor companies culminating in the final 1906 consolidation into the present Consolidated Gas, Electric Light and Power Company?

A. Yes, in a general way, as I have already testified, I think.

Q. From your study of these consolidations, what do you understand to have been their effect on the amounts of outstanding securities and on the book values assigned by the new corporations to the assets acquired from the old corporations?

A. I understand that these consolidations, taken together, resulted in an increase of almost ten million dollars in securities representing no corresponding increase whatever in actual investment. I also understand that this increase in the par values of the outstanding securities was offset by an approximately corresponding increase or write-up of the book values of the properties acquired from the constituent companies.

Q. In your opinion, would this increase or write-up of book values represent the type of increase that might properly be included in the present company's rate base, on the ground that it represents a legitimate item in the acquisition-adjustment account?

A. No, not without far more convincing support for such a claim than I have been able as yet to find in the record of this case. The circumstances of these consolidations, as disclosed by those parts of the record that I have studied, seem to me to furnish persuasive evidence to the contrary.

Q. What circumstances have you in mind

in giving this answer?

A. Two circumstances. In the first place, these consolidations appear to have been effected, mainly if not entirely, by an exchange of securities rather than by purchases for cash. In the second place, even if the transfers of corporate ownership effected by these exchanges of securities were to be treated like bona fide purchase and sale for the purpose of restating the book values of the acquired assets, the par values of the new securities issued in exchange for the old properties could not fairly be taken as measuring actual cash value and hence could not be taken as a measure of the actual cost of the properties to the acquiring company. To put this second point more boldly, the stocks issued in connection with these consolidations appear to have been to a large extent watered stocks.

Q. Will you now please explain what significance you attach to the fact that the various consolidations were brought about chiefly, at least, by mere exchanges of securities rather than by cash purchases?

A. My point is simply this, that since these consolidations were brought about by exchanges of stock rather than by cash purchases, they lacked the characteristic of an ordinary purchase and sale whereby a new owner takes over the properties while the old owner takes his cash and gets out. What we have here is a mere pooling of interests, in which each old stockholder surrenders his stock in his separate company in exchange for stock in the enlarged new company.

Whatever may be the conventional treatment of this type of transaction under the accounting of unregulated business, its significance for rate-making purposes should be obvious. In an ordinary cash purchase of a utility prop-

erty from former owners who have been able to exact a price in excess of original cost, the new owner can make the plausible argument that, unless he is granted a rate base higher than that which would be accorded to the very same property in the hands of the former owners, his purchase would impose upon him a financial loss, and this is a potent argument for recognition of the excess acquisition adjustment cost wherever the purchase of the old property by the new owner at a price in excess of what would be the old owner's rate base was required in the public interest.

On the other hand, if the old owners of the properties, instead of selling out, have merely pooled their separate interests, thus retaining as a group the same assets that they had before the consolidation, they are hardly in a position to urge that they must receive an enhanced rate base because of the price that they have been compelled to pay themselves in order to induce themselves to consent to the merger. Indeed, in the light of the actual circumstances leading up to those particular consolidations now under review, it would seem probable that the transactions were of great benefit to the security holders even without reference to any claim for an enhanced rate base.

I stress this distinction between an ordinary purchase and a pooling of interests with all the more confidence because it has recently been stressed in a public utility accounting case by so distinguished a jurist as Judge Learned Hand. In the same case to which I referred a few moments ago, Judge Hand referred to the 1918 consolidation of properties into the present Niagara Falls Power Company that was a consolidation brought about by a pooling of the interests of the Stetson group

controlling the old Niagara Falls Power Company and the Schoellkopf group controlling the old Hydraulic Company. In expressing the view that this consolidation did not constitute a *purchase* of properties in terms of the applicable system of accounts, which happened there to have been the Interstate Commerce Commission accounts, Judge Hand said, "In short, while it may be tolerable to allow a buyer to capitalize the purchase price he may have paid even though that has been computed upon the assumed continuity of sales which were higher than they should have been, there is surely nothing to be said in favor of allowing two companies mutually to pool their interests and from that time forward to treat as vested the values they happen then to have."

Q. Now, will you please discuss your second point, which as I understand it is that even if these early consolidations were to be treated as if they involved a bona fide purchase of the old properties by the new corporation, still the par values of the securities issued in exchange for the old securities could not be accepted as a measure of the actual cost of the acquired properties.

A. When a corporation acquires property in exchange for its own stock rather than for cash, the cost of the property to the acquiring company is usually measured by the estimated cash value of the stock that is issued by the acquiring company at the time when the exchange is made. Sometimes the par value of this stock has been urged as a measure of its actual cash value, but never legitimately so, unless there is adequate evidence in support of such an assumption.

In the consolidations leading up to the formation of the present company in 1906, the record, unless I have missed



some relevant portion, fails to supply any evidence that the stocks issued in exchange for the old companies were actually worth their par values; the indications seem to be quite to the contrary.

- Q. On what grounds do you conclude that the par values of the securities issued by the continuing corporations for the consolidated properties cannot be accepted as a measure of actual cash values?
- A. On a number of grounds. Consider first the fact that these consolidations occurred in an era when stock watering was notoriously prevalent in railroad and utility financing. It was the general thing to do. In this financing, common stock would frequently be issued as bonus stock or as representing goodwill value or intangibles, and it would be justified not on the ground that it reflected actual market value at the time of the issue but merely on the ground that it reflected what the promoters hoped or believed the enterprise would some day grow up to be worth. No reasonable appraiser with a knowledge of the financial practices of those days would dare to rely on the par values of securities issued in consolida-

tions as reflecting either what properties were worth or what the securities were worth at the time when the transaction took place.

Now consider, in the second place, that in consolidations like those involved in this case there are no parties to the transaction whose self-interest would have dictated the holding down of the total of new security issues to the minimum amounts necessary to effect the transaction. Even assuming complete arms'-length bargaining among the stockholders of the constituent companies, this bargaining operates only to determine the ratios of exchange as between old and new securities. No stockholder has any direct interest in limiting the total over-all capitalization of the new company.

Consider, in the third place, the fact that the Consolidation Plan of 1906 gave to the stockholders of the old companies the option of taking cash instead of common stock in the new company on the basis of a 60 per cent discount for the common stock, that is to say, the old stock holders had the option of taking \$40 in cash instead of \$100 par value of the new common.

## TESTING OBSOLESCENCE IN FIXED ASSETS

OSCAR S. NELSON

**F**IXED ASSETS are, in a sense, deferred charges to operations. It is from this viewpoint that they should be valued on the balance sheet of a "going concern." Recently there has been a change in emphasis on the part of accountants from the balance sheet to the income statement. In line with this change of emphasis, fixed assets should be given balance-sheet values in line with their efficiency as producing

agents. The efficiency of each fixed asset has to be determined by its comparison with other available assets that could be utilized to perform the same service. Thus, a machine whose periodic expenses of operation, maintenance, financing and depreciation total \$500.00 is more efficient than one whose periodic expenses total \$600.00, assuming that both are capable of rendering the same service in production. By the

same token, if the former machine is the most efficient available for the given purpose, then the latter, if already owned, should be carried on the books at a basis determined by the expense of using the more efficient asset, which usually is a value lower than that calculated by ordinary depreciation methods.

A given fixed asset has the capacity to render a certain service in production. This service usually is rendered over a number of accounting periods. The service very often can be measured in units of production, as operations performed, tons produced, or miles operated. Certain sacrifices are necessary on the part of the owner of a fixed asset if he is to use that asset in production. In fact, he foregoes the use of certain funds when the asset is purchased. Those funds are tied up in a fixed investment and eventually disappear entirely when the asset ceases to be of value for any useful purpose. In the meantime the owner also foregoes the interest he would receive periodically if the funds were invested in interest-bearing securities. In addition, funds must be expended periodically for maintenance expenses and operating expenses, if the asset in question is to perform certain operations or turn out a certain product.

The necessary sacrifices to obtain production from a given fixed asset, then, are as follows:

a. Eventual loss of all or a part of the original outlay of funds for the purchase of the asset. This loss or expense ordinarily is called depreciation and is assumed to take place gradually as the asset is used in production.

b. Interest on the funds tied up in the fixed asset. Since the original outlay of funds is assumed to be recovered through the sale of a product or service, the amount of interest is reduced periodically until it reaches zero at the end of the life of the asset, assuming that it has no scrap value.

The interest sacrifice is, then, the amount of interest period by period on the undepreciated amount of the asset.

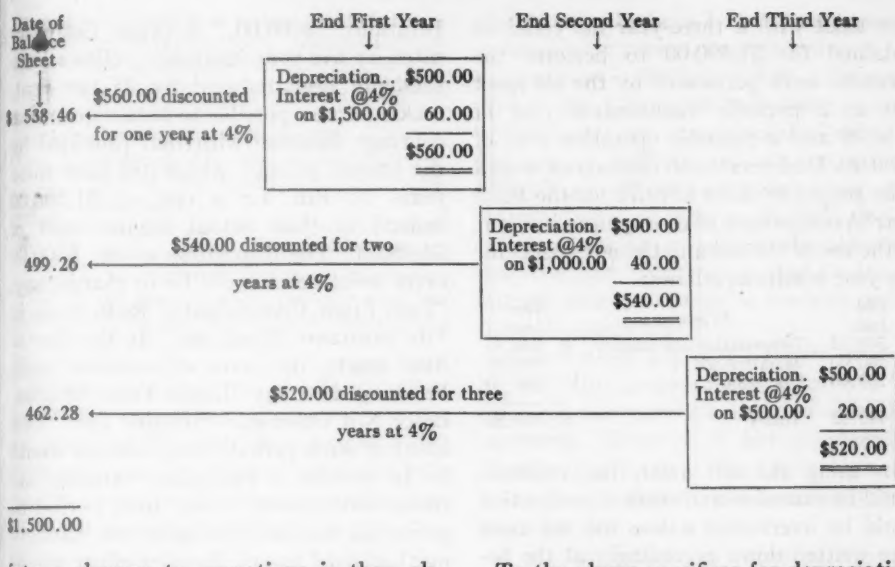
c. The periodic expense of the maintenance of the asset in condition for efficient operation.

d. The periodic expense of the operation of the asset as an agent of production.

As indicated, these sacrifices are not all made simultaneously. The sacrifices of depreciation and interest are made at the time of the purchase of the asset. The other sacrifices are made from day to day as repairs are made and as wages and other expenses of operation are incurred. It may be assumed without great error that maintenance and operation expenses are incurred periodically as of the end of each accounting period. The longer the accounting period, the greater will be the error resulting from this assumption.

The sacrifice of depreciation and interest having been made at the outset, an asset value is set up on the balance sheet. This amount is then a deferred charge to operations and will be charged off periodically over the life of the asset. The asset amount is in reality the present worth of the periodic charges for depreciation and interest. An example will serve to clarify this statement. A fixed asset having an estimated life of three years and no scrap value is purchased for \$1,500.00. Interest rates are around 4 per cent. The initial balance sheet value is \$1,500.00, represented in the chart below.

It is thus evident that the balance-sheet amount is the present value of future periodic charges on account of depreciation and interest. If it is desired that the periodic charges for depreciation and interest total the same for each period, the compound interest or annuity method of computing depreciation and interest should be used. For this example, the periodic amount of depreciation and interest combined is \$540.52. The present value of



future charges to operations is then obtained as follows:

$$\begin{aligned} \$519.73 &= \$540.52 \text{ discounted one year at } 4\%, \\ 499.75 &= 540.52 \text{ discounted two years at } 4\%, \\ 480.52 &= 540.52 \text{ discounted three years at } 4\%, \end{aligned}$$

and \$1,500.00 = the present asset amount.

The asset amount at the end of the first, the second, and the third years after purchase is found as follows:

Cost of asset .....	\$1,500.00
Plus interest for one year at 4% .....	60.00
	<u>\$1,560.00</u>
Less periodic charge for depreciation and interest .....	540.52
Asset amount, end of first year .....	\$1,019.48
Plus interest for one year at 4% .....	40.78
	<u>\$1,060.26</u>
Less periodic charge for depreciation and interest .....	540.52
Asset amount, end of second year .....	\$ 519.74
Plus interest for one year at 4% .....	20.78
	<u>\$ 540.52</u>
Less periodic charge for depreciation and interest .....	540.52
Asset amount, end of third year .....	<u>\$ 0.00</u>

<sup>1</sup> The periodic expense of \$540.52 is counteracted in part by interest income amounts of \$60.00, \$40.78, and \$20.78 for the three periods, respectively.

To the above sacrifices for depreciation and interest must, of course, be added the sacrifices that will be necessary from period to period for maintenance and operation. Assuming these to be uniform from period to period and to amount to \$200.00 and \$700.00, respectively, the total periodic charge to operations is as follows:

Depreciation and interest .....	\$ 540.52
Maintenance .....	200.00
Operation .....	700.00
Total .....	<u>\$1,440.52</u>

If the \$200 for maintenance and the \$700 for operation are not excessive, i.e., not above that experienced by manufacturers who are using the most efficient equipment available, there is no reason to question the amounts shown on the balance sheet at the end of each period as indicated in the computation at the left. However, if investigation shows that at, say the end of the second year of the life of the asset a substitute asset is obtainable the use of which would substantially reduce expenses, is not obsolescence indicated and should not the balance sheet amount be changed accordingly? Assume, for example, that a

new asset with a three-year life could be obtained for \$1,500.00 to perform the identical work performed by the old asset but at a periodic maintenance cost of \$100.00 and a periodic operation cost of \$500.00. Under such circumstances, would it be proper to defer \$519.74 for the third year? A comparison of the expenses incident to the use of the old and the new assets for one year results as follows:

<i>Old Asset</i>	<i>Expense</i>	<i>New Asset</i>
\$ 540.52	Depreciation and interest	\$ 540.52
200.00	Maintenance	100.00
700.00	Operation	500.00
<u>\$1,440.52</u>	Totals	<u>\$1,140.52</u>

In using the old asset, the expenses would be excessive and costs of production would be overstated unless the old asset were written down accordingly at the beginning of the third year. To equalize the expenses, the amount available for depreciation and interest in the case of the old asset would have to be reduced from \$540.52 down to \$240.52. By discounting \$240.52 for one year at 4 per cent the adjusted balance-sheet amount is obtained. It is \$231.27, obtained by dividing \$240.52 by 1.04. The difference between \$519.74 and \$231.27, or \$288.47, should then be disposed of in some manner other than by charging cost of production. Restated, the old asset amount for balance-sheet purposes at the end of the second year should be computed as follows:

\$540.52 discounted for one year at 4% = \$519.73, less discounted amount of the excessive maintenance and operation for one year, \$300.00 discounted for one year at 4%	= 288.46,
net balance sheet amount, as above	<u>\$231.27</u>

The above is a somewhat radical departure from accustomed methods of valuing fixed assets and of determining expenses. It is like saying that the account "Prepaid Insurance, \$1,200.00" should be set forth in the Balance Sheet as "Prepaid

Insurance, \$900.00," because insurance rates on five-year insurance policies have suddenly been reduced by 25 per cent, making it now possible to obtain insurance coverage identical with that provided by the present policies, which still have three years to run, for a cost of \$1,500.00 instead of their actual original cost of \$2,000.00. The disposition of the \$300.00 extra write-down could be to charge, say, "Loss From Unanticipated Reductions in Fire Insurance Premiums." In the case of fixed assets, the extra write-downs could be charged to, say "Losses From Obsolescence Not Otherwise Provided For." One effect of such periodic write-downs would be to provide a fixed-asset variance account which would reveal from period to period the results of the inefficient management of fixed assets. Another effect would be to place all companies or managers dealing with similar fixed assets upon a common ground as regards the expenses of using such assets in production. A sort of unit standard fixed-asset cost could in this manner be set up to test the use efficiency as distinct from the acquisition efficiency of management with regard to fixed assets.

The principles enunciated above also may be used to advantage in deciding when a particular fixed asset should be replaced by a more efficient unit. If an old asset is so inefficient that its periodic out-of-pocket operating and maintenance expenses are greater than the total periodic expenses, including interest and depreciation, of a new asset available for the same service, then it obviously has no value except as scrap and should be replaced, since total periodic expenses can be reduced by so doing. A simple formula can be developed to aid in the solution of such problems. The following is illustrative:

- Let  $o$  = the amount of the periodic operating expenses of an old machine,  
 $m$  = the amount of the periodic maintenance expenses of the old machine,

$q$  = the decrease in trade-in value of the old machine expected to result from its use for one more period in production, plus interest for one period on beginning trade-in value,

$O$  = the amount of the periodic operating expenses of a new machine that will perform the identical service in production,

$M$  = the amount of the periodic maintenance expenses of the new machine.

$I$  = the amount of the periodic interest on the investment in the new machine,

and  $D$  = the amount of the periodic depreciation on the new machine.

Now, if  $o+m > O+M+I+D$ , it is then financially advantageous to replace the old asset by the new.<sup>2</sup> It is assumed, for example, that the periodic expenses incident to the use of the old and new machines in production are as follows:

<i>Old Machine</i>	
Operating Expenses.....	\$1,000.00
Maintenance Expenses.....	500.00
Total.....	<u>1,500.00</u>

It is quite evident that the new machine is less expensive to operate, and that the old machine has no balance-sheet value other than scrap or trade-in value. If the facts of the foregoing illustration are changed to the following:

<i>Old Machine</i>	
Operating Expenses.....	\$ 900.00
Maintenance Expenses.....	400.00
Total.....	<u>\$1,300.00</u>

then,  $o+m < O+M+I+D$ , and it becomes necessary to consider interest on the trade-in value of the old asset and any possible decrease in trade-in value through

one more year of use before making a decision. If the present trade-in value of the old machine is \$500.00 and it is expected that it will have a trade-in value of only \$400.00 after one more period of use, the decrease of \$100.00 and the interest on \$500.00, say \$20.00 (assuming 4 per cent for one year), amount to \$120.00, and it still is advisable to replace the old asset with the new. Since ( $q$ ) is used to denote interest plus the change in trade-in value, the following is true:

If  $(o+m+q) > (O+M+I+D)$ , then it is financially advantageous to trade in the old asset and purchase the new asset immediately. However, if  $(o+m+q) < (O+M+I+D)$ , then it is financially advisable to use the old asset at least one more period in production.

<i>New Machine</i>	
Operating Expenses.....	\$ 800.00
Maintenance Expenses.....	100.00
Interest on Investment.....	200.00
Depreciation.....	300.00
Total.....	<u>\$1,400.00</u>

This formula can be made more manageable if stated as an equation rather than as above set forth.

Let  $b = (O+M+I+D) - (o+m)$ , the excess of the total of all expenses expected to be incurred by using the new asset for one

<i>New Machine</i>	
Operating Expenses.....	\$ 800.00
Maintenance Expenses.....	100.00
Interest on Investment.....	200.00
Depreciation.....	300.00
Total.....	<u>\$1,400.00</u>

period over the out-of-pocket expenses (only) expected to be incurred by using the old asset one period.

then, if ( $b$ ) is greater than ( $q$ ), it would pay to use the old asset for at least one more period, whereas if ( $q$ ) is greater than ( $b$ ), it would pay to trade in the old asset

<sup>2</sup> The symbol  $>$  denotes "is greater than" and the symbol  $<$  denotes "is less than."



on the purchase of a new one immediately.

If the two assets do not perform identical services because of different capacities, or for some other reason, the above formula can be modified to place the two assets upon an equivalent basis by introducing quantities of production as elements. For example,

Let  $u$  = the number of units of output of the old asset for one period,  
and  $U$  = the number of units of output of the new asset for one period,  
then, the formula becomes,

$$b = u \left( \frac{O + M + I + D}{U} - \frac{o + m}{u} \right).$$

The value of  $(b)$  then denotes the advantage that a machine producing  $(u)$  units of output has over a new machine producing the equivalent number of units of output, except for possible decrease in trade-in value and interest on trade-in value as before. If  $(b)$  is greater than  $(q)$  it is better to retain the old asset in production, whereas if  $(q)$  is greater than  $(b)$  it is better to acquire the new asset.

The usual practical case is more complicated than the above illustration, however. Operating and maintenance expenses vary from period to period because of the changing physical condition of the asset and because of the changing price level. The amount of interest on the investment depends upon the rate assumed and upon the book value of the asset. The amount of depreciation depends upon the method of computing depreciation and upon the cost, trade-in value, and life of the asset. In addition, the two assets may not be capable of performing identical service because of difference in capacity, etc.

Assuming that the average operating and maintenance expense per period for the remaining useful life of both the old and new assets can be accurately estimated, the total periodic expense on the average

may be determined for both the old and new assets by using the annuity or compound-interest method of computing depreciation and interest, since under this method depreciation plus interest is constant. This procedure gives results that are accurate enough for all practical purposes and avoids the use of a total of expenses which varies from period to period. Upon this basis, the formula used above can be elaborated as follows:

Let  $(o + m) = e$ , the average periodic out-of-pocket expense of using the old machine in production,

$(O + M) = E$ , the average periodic out-of-pocket expense of using the new machine in production to perform the identical service in production now performed by the old machine,

$C$  = the cost of the new machine, and  
 $n$  = the estimated life of the new machine in periods.

Now, if the annuity or compound-interest method of computing depreciation and interest on the new asset is used,

$$D + I = \frac{C}{a_{\overline{n}|i}},$$

where  $a_{\overline{n}|i}$  is the present value of an annuity of one per period for  $n$  periods at the rate of interest assumed, denoted as the rate  $(i)$  per period. The following equation then holds:

$$b = \frac{C}{a_{\overline{n}|i}} + E - e.$$

When  $(b)$  is a minus quantity or is less than  $(q)$ , it becomes financially advantageous to purchase the new asset and to trade in the old.

To determine when to trade in an old asset and purchase a new one to perform the identical service in production, the above formula should be employed periodically. For example, a  $1\frac{1}{2}$  ton truck is used

by a manufacturer to make deliveries. The truck has been in service for four years and has a present trade-in value of \$300.00 and a trade-in value one year hence of \$200. It is estimated that the out-of-pocket expenses incident to its use one more year would total \$1,500.00. It is ascertained that a new truck to perform the same service can be obtained at a cost of \$1,800.00. The estimated life of the new truck is six years, and the estimated average out-of-pocket expenses per year of the new truck total \$1,300.00. Assuming an interest rate of 4 per cent, would it pay to trade in the old truck on the purchase of a new one at the present time?

Using the formula,

$$b = \frac{C}{a_n^s} + E - e,$$

and substituting the above values, results as follows:

$$\begin{aligned} b &= \frac{1,800}{5.24214} + 1,300 - 1,500. \\ &= 343.37 + 1,300 - 1,500. \\ &= 143.37. \end{aligned}$$

Since the resulting value of (b), namely, \$143.37, is greater than \$112.00, the value of (q) (the sum of the decrease in trade-in value during the ensuing year, \$100.00, and interest on \$300.00 at 4 per cent for one year, \$12.00), it would pay to continue to use the old truck at least one more year. At the end of the fifth year, however, the formula should be applied again. Assuming that all the facts are as above and that the estimated out-of-pocket expenses of using the old truck during the sixth year total \$1,700.00, would it pay to operate the old truck for the sixth year?

Again using the formula,

<sup>1</sup>  $a_{51} = a_{57} = 5.25214$ , which is the present value of one per period for six periods at 4 per cent interest per period.

$$b = \frac{C}{a_n} + E - e,$$

and substituting, produces the following:

$$\begin{aligned} b &= 343.37 + 1,300 - 1,700, \\ &= -56.63. \end{aligned}$$

Since a minus value of (b) results, it would pay to replace the old truck at the beginning of its sixth year of life, regardless of any further change in trade-in value or the interest on the beginning trade-in value.

In the above discussion, it was assumed that the new asset would perform the identical service performed by the old. The formula requires a slight modification to fit cases in which the quantities of service performed by the two assets are not the same and those in which the new asset is merely an addition to, a rebuilding of, or other improvement of the old asset to increase its efficiency. The expense per unit of output of the two assets must then be compared to test the advantage of the one over the other.

Starting with the formula,

$$b = \frac{C}{a_n} + E - e,$$

the number of units of output of each asset may be introduced to give effect to the unit cost. Using symbols for units as set forth above,

$\frac{e}{u}$  = the out-of-pocket expense per unit of production that will result from using the old asset one more period,

$\frac{\frac{C}{a_n} + E}{U}$  = the expense per unit of production if the new asset is used, including depreciation and interest.

The difference in the unit expense is then found by subtraction, as follows:

$$\frac{\frac{C}{a_n} + E}{U} - \frac{e}{u} = \text{the difference in unit expense of the new and old assets for the ensuing accounting period.}$$

The total saving through the use of the old asset for one more period is then found by multiplying the unit saving by the number of units the old asset will produce. The complete formula is as follows:

$$b = u \left( \frac{\frac{C}{a_n} + E}{U} - \frac{e}{u} \right)$$

If the resulting value of (b) is negative or if it is less than (q), it is financially advantageous to replace the old asset immediately, assuming that there are no other considerations to the contrary.

The formula can be applied to a problem involving several choices. For example, a machine having an expected life of one more year has a present trade-in value of \$10,000.00. A more efficient automatic machine, having an expected life of ten years, can be purchased for \$80,000.00. An automatic attachment for the old machine to increase its efficiency can be purchased for \$5,000.00. Estimated operating data are as follows:

Per Year	Old Machine	Old Machine with Attachment	New Machine
Units of output...	600	1,000	1,200
Operating expenses	\$8,000.00	\$9,000.00	\$6,000.00
Maintenance expenses.....	5,000.00	5,000.00	1,000.00
Interest at 4%			

Which alternative should be chosen, assuming that there are no other considerations?

\* If the value of (b) as of the beginning of the period is desired, the value as found by the formula should be discounted by dividing by  $(1+i)$  or  $(1+i/2)$  depending upon whether it is assumed that the expenses are incurred as of the end of the period or as of the middle of the period. For all practical purposes no discounting is necessary.

#### Old Machine vs. Old Machine with Attachment

$$\begin{aligned} b &= 600 \left( \frac{\frac{5,000.00}{.96154^5} + 14,000.00}{1,000} - \frac{13,000.00}{600} \right) \\ &= 600 \left( \frac{5,200.00 + 14,000.00}{1,000} - \frac{13,000.00}{600} \right) \\ &= 600(19.20 - 21.67) \\ &= -1,482.00 \end{aligned}$$

Since (b) is negative, it would pay to purchase the attachment as compared with using the old machine without the attachment.

#### Old Machine with Attachment vs. New Machine

$$\begin{aligned} b &= 1,000 \left( \frac{\frac{80,000.00}{8.1109^6} + 7,000.00}{1,200} - 19.20 \right) \\ &= 1,000 \left( \frac{9,863.27 + 7,000.00}{1,200} - 19.20 \right) \\ &= 1,000(14.05 - 19.20) \\ &= -5,150.00 \end{aligned}$$

Since (b) again is negative, it would be more economical to use the new automatic machine than the old machine with automatic attachment. Aside from other considerations, the purchase of a new machine is indicated as being the best of three possibilities.

Throughout the foregoing discussion, it was assumed that the old machine would be serviceable for only one additional period. With a slight modification the formula may be used to test obsolescence of fixed assets having an expected additional serviceable life of two or more additional periods. If it is assumed that the expenses incident to using a machine in pro-

\*  $a_{\overline{n}|i}$  or  $a_{\overline{n}|i}$  = .96154 at 4% interest.

\*  $a_{\overline{n}|i}$  or  $a_{\overline{n}|i}$  = 8.1109 at 4% interest.

duction are incurred as of the end of the accounting period in each case,<sup>7</sup> the formula for the present value of an annuity may be used to determine the present worth of the periodic savings which are expected to continue for a number of periods.

Let  $B$  = the present worth of the periodic savings<sup>8</sup> which will result each period for a number of periods through the use of an old asset in production instead of a new asset that could be purchased and used for the same purpose, and  $b_1, b_2, b_3$ , etc. equal the savings for successive accounting periods, then,

$$B = \frac{b_1}{1+i} + \frac{b_2}{(1+i)^2} + \dots + \frac{b_{n-1}}{(1+i)^{n-1}} + \frac{b_n}{(1+i)^n}$$

or, using the formula for  $b$  in each case,

$$B = \frac{1}{1+i} \left( \frac{\frac{C}{a_n} + E}{U} - \frac{e_1}{u_1} \right) + \frac{1}{(1+i)^2} \left( \frac{\frac{C}{a_n} + E}{U} - \frac{e_2}{u_2} \right) + \text{etc.}$$

But, where  $b_1 = b_2 = b_3 = \text{etc.}$ , the formula for the present value of an annuity may be used, and the formula becomes,

$$B = ua_n \left( \frac{\frac{C}{a_n} + E}{U} - \frac{e}{u} \right).$$

<sup>7</sup> Other assumptions may be made if desirable in a given case and the formula altered accordingly, e.g., that expenses are incurred at the beginning of the period or that they are incurred in the middle of the period.

<sup>8</sup> By "savings" is meant merely the excess of  $(D + I + E)$  over  $(e)$ , or the amount denoted by  $(b)$ .

When the formula

$$b = u \left( \frac{\frac{C}{a_n} + E}{U} - \frac{e}{u} \right)$$

is used, the purchase of the new asset and the scrapping of the old is indicated as advantageous whenever  $(b)$  is less than  $(q)$ . Since, according to the above,

$$B = a_n b,$$

then a trade-in is indicated if

$$B < \left( \frac{q_1}{1+i} + \frac{q_2}{(1+i)^2} + \dots + \frac{q_{n-1}}{(1+i)^{n-1}} + \frac{q_n}{(1+i)^n} \right).$$

Now, let  $T$  = the trade-in value of the old asset at the present time, i.e., at the time the test of obsolescence is made.

and  $T_1, T_2, \dots, T_{n-1}, T_n$  = the trade-in value of the old asset one period, two periods, etc., subsequent thereto.

Then,

$$q_1 = T - T_1 + Ti,$$

$$q_2 = T_1 - T_2 + T_2i, \text{ etc.}$$

Now, let

$$Q = \frac{q_1}{1+i} + \frac{q_2}{(1+i)^2} + \dots + \frac{q_{n-1}}{(1+i)^{n-1}} + \frac{q_n}{(1+i)^n}.$$

Then,

$$Q = \frac{(T - T_1 + Ti)}{1+i} + \frac{(T_1 - T_2 + T_2i)}{(1+i)^2} + \dots + \frac{(T_{n-2} - T_{n-1} + T_{n-1}i)}{(1+i)^{n-1}} + \frac{(T_{n-1} - T_n + T_{n-1}i)}{(1+i)^n},$$

and,

$$\begin{aligned}
 Q &= \frac{(1+i)T - T_1}{1+i} + \frac{(1+i)T_1 - T_2}{(1+i)^2} + \dots \\
 &\quad + \frac{(1+i)T_{n-2} - T_{n-1}}{(1+i)^{n-1}} + \frac{(1+i)T_{n-1} - T_n}{(1+i)^n} \\
 &= T - \frac{T_1}{1+i} + \frac{T_1}{1+i} - \frac{T_2}{(1+i)^2} + \dots \\
 &\quad + \frac{T_{n-2}}{(1+i)^{n-2}} - \frac{T_{n-1}}{(1+i)^{n-1}} \\
 &\quad + \frac{T_{n-1}}{(1+i)^{n-1}} - \frac{T_n}{(1+i)^n} \\
 &= T - \frac{T_n}{(1+i)^n}
 \end{aligned}$$

It is advantageous to purchase a new asset and trade in the old asset if  $B$  is less than  $Q$  or, in other words, if  $B$  is less than the present trade-in value of the old asset minus the trade-in value of the old asset at the end of its useful life discounted for the number of periods in its life. If it is assumed that the old asset will have no trade-in value at the end of its useful life, then it is advantageous to dispose of the old asset if  $B$  is less than  $T$ , its present trade-in value.

The value ( $B$ ), also, may be looked upon as the basis for valuing the asset on the balance sheet. The value ( $B$ ) represents the present value of the future services of the asset in production or the portion of the original cost of the asset that should be deferred to future accounting periods. The deferring of a larger amount would be in error, since the same future services could now be obtained at that amount of present outlay by buying an available alternate asset to perform the equivalent service. The above may be clarified by the use of an example. A machine having an expected remaining life of four years is now in use in a manufacturing plant. Its annual out-of-pocket expense of operation and maintenance is \$1,500.00, and it processes 1,000

units of product per year. A new, improved model of the machine can be purchased at a cost of \$5,000.00. The new machine has an estimated life of 10 years, has out-of-pocket operating and maintenance expenses of about \$2,000.00 per year and processes 1,500 units of product annually. Assuming interest at 4 per cent, a present trade-in value of the old machine of \$500.00, and no trade-in value for either machine at the end of its estimated useful life, what is the balance-sheet basis for the old machine, and will it pay to scrap it immediately?

Using the formula,

$$B = u a_{\overline{n}|i} \left( \frac{\frac{C}{a_{\overline{n}|i}} + E}{U} - \frac{e}{u} \right),$$

and substituting the above values results as follows:

$$\begin{aligned}
 B &= 1,000 a_{\overline{4}|.04} \left( \frac{\frac{5,000.00}{a_{\overline{4}|.04}} + 2,000.00}{1,500} - \frac{1,500.00}{1,000} \right) \\
 &= 1,000 \times 3.62990 \left( \frac{\frac{5,000.00}{8.1109} + 2,000}{1,500} - 1.50 \right) \\
 &= 3,629.90 \left( \frac{2,616.45}{1,500} - 1.50 \right) \\
 &= 3,629.90 (1.7443 - 1.50) \\
 &= 3,629.90 \times 0.2443 \\
 &= \$886.79.
 \end{aligned}$$

Thus, the balance-sheet basis is \$886.79 and since this is more than the present trade-in value, namely, \$500.00, it would not pay to replace the old asset at this time.\* If the old asset has a book value of more than \$886.79, an element of obsoles-

\* The formula,  $b = u \left( \frac{\frac{C}{a_{\overline{n}|i}} + E}{U} - \frac{e}{u} \right)$  is better for this purpose, however.



cence not considered in establishing the depreciation rate may be indicated. The new basis may well be used in determining the amount of adjustment to be made for inadequate depreciation of the past.

In many cases a scrap value is assumed in computing depreciation. The formula here developed can be altered if desired to provide for a scrap value in computing depreciation and interest on the new asset.

Let  $S$  = The scrap value of the new asset at the end of its useful life, then, the formula becomes,

$$B = ua_n \left( \frac{\frac{C-S}{a_n} + Si + E}{U} - \frac{e}{u} \right).$$

Now, if

$$B = ua_n \left( \frac{\frac{C-S}{a_n} + Si + E}{U} - \frac{e}{u} \right),$$

and,

$$Q = T - \frac{T_n}{(1+i)^n},$$

and it is advantageous to trade in the old asset and purchase a new one when  $B$  is less than  $Q$ , then the advantage (denoted by  $A$ ) that the old asset has as an agent of production for its owner as compared with the new asset can be expressed as follows:

$$A = ua_n \left( \frac{\frac{C-S}{a_n} + Si + E}{U} - \frac{e}{u} \right) - \left( T - \frac{T_n}{(1+i)^n} \right).$$

$$A = ua_n \left( \frac{\frac{C-S}{a_n} + Si + E}{U} - \frac{e}{u} \right) - \left( T - \frac{T_n}{(1+i)^n} \right)$$

When  $A$  is less than zero it is advantageous to purchase the new asset.

An example will serve to illustrate the operation of the above formula. A study was made of the cost of operating a fleet of one and one-half ton trucks used in delivery service by a manufacturing company. It was found that the usual experience with such trucks was as follows:

Cost new, each, usual.....	\$1,800.00
Useful life, in years, usual.....	6
Distance operated, miles per year, average.....	25,000
Trade-in value, end of sixth year, usual....	\$ 200.00
Maintenance and operation expenses, per year, average.....	\$1,200.00

Experience seemed to indicate that this type of truck was the most economical for the purpose that could be obtained. Occasionally a truck was purchased which seemed to be less efficient than the usual run, and it was necessary to decide whether to dispose of it before the usual six years of service expired. Individual records of expenses incurred, mileage of operation, etc., are maintained. The record of a particular truck revealed maintenance and operation expenses that were considerably out of line with the average and the superintendent questioned whether it should not be disposed of immediately. The following facts were available:

Years operated.....	3
Average mileage per year.....	20,000
Maintenance and operation expenses per year, average.....	\$1,100.00
Trade-in value, end of third year.....	\$ 800.00

It was expected that the operation record would be even less favorable in the future than in the past. On the record as stated, should the truck be replaced by a new one? Assume an interest rate of 4 per cent. Following is the solution, using the above formula:

$$\begin{aligned}
&= 20,000 \left( \frac{1,800.00 - 200.00}{25,000} + 200.00 \times .04 + 1,200.00 \right) - \left( 800.00 - \frac{200.00}{(1.04)^3} \right) \\
&= 20,000 \times 2.775091 \left( \frac{1,600.00}{5.242137} + 8.00 + 1,200.00 \right) - \left( 800.00 - \frac{200.00}{1.1249} \right) \\
&= 55,501.82 \left( \frac{305.21923 + 1,208.00}{25,000} - .055 \right) - (800.00 - 177.7936) \\
&= 55,501.82 (.0605288 - .055) - (622.2064) \\
&= 306.86 - 622.21 \\
&= -315.35.
\end{aligned}$$

Since (A) is a minus quantity, it is advantageous to trade in the old truck and purchase a new one immediately.

## STUDYING AUDITING PROCEDURE

WALTER A. FOY

IT SEEMS desirable in the teaching or studying of auditing to keep an eye on the pronouncements of the American Institute of Accountants. There are at least two good reasons for this. First, the Institute's pamphlet *Examination of Financial Statements* and its *Statements of Auditing Procedure* are admittedly the expert opinion of high authority. Second, the auditing student will probably sometime take the CPA examination prepared by the Institute. It is only common sense for the student to prepare for this examination by studying the auditing principles laid down by the Institute's committee on auditing procedure.

However, the student finds great difficulty in assimilating a group of clear-cut ideas of any degree of comprehensiveness by attempting to learn the Institute's statements as they are written and published. A seasoned practitioner with years of auditing experience has developed methods of work which have congealed into his own personal audit programs. He has crystallized his practice and theory

into an audit program which is more or less flexible when applied to different situations. He has developed and learned bit by bit his audit procedures largely through the long and hard road of experience. There is no adequate substitute for such experience; but the trial-and-error methods of experience can be lightened by proper learning of well-organized teaching material on auditing. The experienced practitioner sees immediate significance in the *Examination of Financial Statements* and in the *Statements of Auditing Procedure*. But a good part of his ready recognition of this significance comes from the background of laborious experience during which he has developed his own audit program, consciously or unconsciously.

In marked contrast, the beginning student of auditing can not readily grasp the significance of these auditing principles, procedures, and detailed auditing steps. The student in a one-semester course in auditing finds the subject matter of the Institute's publications intangible,

indefinite, and almost impossible to learn in an orderly and significant way. In other words, it is not good teaching to present the Institute's pamphlet to the student with the words, "Here, learn this; it is the authoritative statement of the minimum requirements of a good audit." The student may conscientiously try to learn, perhaps memorize, the entire program with its sixteen sections on Cash, Notes Receivable, etc. But he will find it practically impossible to retain a real working knowledge of these sixteen audit programs. Besides, in order for the student to be posted on the latest thinking of the Institute on auditing developments it is usually recommended that he obtain copies of all Statements of Auditing Procedure and abstract the substance therefrom. In abstracting material from the *Examination of Financial Statements* and Statements of Auditing Procedure, to correlate the material and to organize it in an orderly and significant manner will require the student's diligent efforts for most of the rest of the auditing course, unless he attempts to memorize the whole conglomeration as hundreds of candidates for the CPA examinations undoubtedly attempt to do each year. This is a waste of learning-man-hours and should be remedied either by the teaching profession, or by the Institute in its educational program, or by both.

The student must have clear-cut ideas of the theory of accounts and a definite mental picture of his course of action before he can successfully attack an accounting or auditing problem. If he studies the Institute's *Examination of Financial Statements* as written, his mental picture of his course of action in an audit will more than likely be hazy and inadequate. It must be recalled that most university students of auditing have not seen a commercial set of books and have had no accounting practice except that afforded

by the laboratory. It must also be added that most junior accountants employed by public accounting firms, although they have worked with actual accounting records, do not have the broad perspective necessary for a ready organization and understanding of the material as presented by the Institute. In short, the Institute's pronouncements are not on the level of the auditing student; they are on the level of the seasoned practitioner.

The foregoing statement should not be regarded as a criticism of the Institute nor of its pamphlet. The Institute's pamphlet and its Statements of Auditing Procedure are the considered pronouncements of those in the profession who represent expert opinion. Such pronouncements must be respected; their content would be difficult to question. However, it is the manner of presentation which makes the teaching of the material difficult. Such a presentation is probably necessary when an averaging of the opinions of experts occurs as it undoubtedly does here. Also the concise manner of presentation leaves the student with a feeling of vagueness, because much of the content represents a distillation of diversified experience into generalizations.

What then can be done to help the student of auditing to grasp the subject matter more readily? The answer is not a simple one, but a notable contribution would be made if a new manner of presentation of the Institute's program could be devised, a program which would be easier to learn and understand. Is it possible by analysis and reclassification of the ideas in the sixteen sections, Cash, Notes Receivable, etc., to accomplish this? The division of each of the sixteen programs into logical subdivisions may be useful, since this is an obvious method of clarifying any subject matter. Classification of like things under the same heading is one of the methods of science. Let us

make an attempt to subdivide the sixteen programs contained in the Institute's audit program for the balance sheet.

It is relatively easy to attain agreement on the need for classification but it is more difficult to decide on an acceptable basis or bases for such classification. Numerous kinds of classificatory subdivisions suggest themselves. But any classification, to be practical, must depend on the purpose for which the classified material is to be used. The assumption is that the student desires to learn the programs so that he will be able to make a more effective audit, and not merely in order to pass either a course in auditing or the CPA auditing examination. Therefore, it would appear that operational classifications—classifications in terms of doing the necessary auditing work—would fulfill the main purpose and be practical.

Of course, the material itself suggests classifications of an operational nature. For example, it is clear that certain detailed auditing steps are found in parts of the balance sheet programs. A subdivision called "Detailed Auditing Steps" may be set up as one of the groups. It also becomes evident from the recommendations of the Institute in its Statements of Auditing Procedure that certain chief bases for substantiating the trial balance figures are being suggested. For example, with respect to accounts receivable it is distinctly indicated as standard auditing procedure that accounts receivable are to be confirmed. Confirmation, then, is obviously one of the chief bases for substantiating the trial balance figure for accounts receivable. Studying the pronouncements further, it is also plain that certain generally accepted accounting principles are given. Most of these apply to the way certain items shall be stated on the balance sheet. For example, as to notes receivable it is stated "Notes from stockholders, directors, officers and em-

ployees and also notes arising from transactions outside the ordinary business of the company should be shown separately on the balance sheet." A similar principle is enunciated for accounts receivable, notes payable, and accounts payable. Thus, certain accounting principles are suggested to the auditor in the program of the Institute. Perhaps it would be advisable then to set up a classification called "Generally Accepted Accounting Principles Involved."

It has already been suggested that a classification entitled "Detailed Auditing Steps" be used. Another related grouping is needed, "Chief Auditing Procedures," which may be considered by some as only a summary of the detailed audit steps. However, it is a helpful classification to have since it clearly focuses the mind on the major aspects of the detailed auditing steps and aids in dispelling confusion and vagueness.

The four main classifications applicable to each of the sixteen programs are as follows:

- I Chief Basis for Substantiating the Trial Balance Figure.
- II Generally Accepted Accounting Principles Involved.
- III Chief Auditing Procedures.
- IV Detailed Audit Steps.

It is believed that the above are operational classifications suitable for the purpose of presenting clearly what should be done in carrying out the particular audit program. There is a possible exception, namely, Class II, "Generally Accepted Accounting Principles Involved." But this classification may also be considered operational in the sense that it tells the auditor to do something in a certain manner. For instance, it says to the auditor, "On the balance sheet separate from trade receivables all receivables from stockholders, directors, officers, and employees."

At first glance it may appear difficult properly to segregate under these four headings everything included under say, Accounts Receivable or Inventories to be found in both the *Examination of Financial Statements* and the pertinent Statements of Auditing Procedure. It is, of course, difficult to reorganize any body of expert opinion without doing some injustice or violating the thought involved. But it can be done, and the results in more efficient teaching and learning are rewards enough to warrant overlooking the hazards.

It is apparent that the classifications suggested are not consciously followed in the programs given in the pamphlet. A paragraph in one of the sixteen programs may contain, all in one breath, so to speak, a "Generally Accepted Accounting Principle," a "Detailed Audit Step," and the "Chief Basis for Substantiating the Trial Balance Figure." Moreover, the sequence of paragraphs in the pamphlet does not seem to follow any apparent order and does not fit into the classifications suggested. Therefore, to reorganize the material under the suggested headings requires considerable effort.

It is illuminating to compare the "Chief Basis for Substantiating the Trial Balance Figure" for each of the sixteen sections of the balance sheet examination. Definite summarizations can be abstracted from most of the sections. This is especially true of Cash, Notes and Accounts Receivable, and Inventories, which have had much attention by the profession in recent years. Some "Chief Bases for Substantiating the Trial Balance Figures" stand out clearly on analysis. These are as follows: physical count, confirmation, doc-

umentary evidence, and representation. Others are almost impossible to summarize except by such words as test-checks, account analysis, consideration of accounting procedures, etc.

This general comparison of the "Chief Bases for Substantiating the Trial Balance Figure" for the sixteen programs indicates that some are clear-cut whereas others are not. Specifically, for instance, for accrued liabilities there is no one base but rather various bases for substantiation depending on the type of accrued liability. The audit program for accrued liabilities becomes somewhat hazy and vague when analyzed under the four classifications suggested. This is important to know, because the student then realizes he must learn the basis for substantiating each type of accrued liability. It is also important because it may amount to a revelation that the Institute's program either unconsciously or consciously has omitted what would seem a major factor, i.e., "The Chief Basis for Substantiation of Accrued Liabilities."

To aid the student further in obtaining a concise and definite picture of the sixteen audit programs composing the balance sheet examination, a "Key" could be shown on the left-hand margin of the pamphlet. This "Key" is a memorizing device and should be confined so far as possible to one or two words for each point in the audit program outline.

To illustrate one part of the balance sheet examination outlined in the Institute's pamphlet and Statements of Auditing Procedure, the writer's reclassification and reorganization of the audit program for the Accounts Receivable section is presented below:

"Key"

Chief Basis

A. Confirmation

Audit Program for Accounts Receivable

Chief Basis for Substantiating the Trial Balance Figure

A. Confirmation



Confirmation or disclosure in report

#### B. Account Analysis

Balances listed by age

#### Auditing Procedures

##### A. Confirmation

1. Methods
2. Mailing

##### B. Account Analysis

1. Composition of balances
2. Reserve for past due disputed items
3. Write-off approval
4. Reconcile list

#### Audit Steps

##### A. Inquire

1. Trade discounts
2. Cash discounts over 2%
3. Freight allowed
4. Price reductions; defective material allowances.

#### Accounting Principles

##### A. Balance Sheet

1. Credit balances
2. Deduct reserve
3. Title not passed
4. Over one year
5. Outside accounts (stockholders, etc.)
6. Deposits and guaranties

Confirmation of accounts receivable by direct communication with the debtor is regarded as a generally accepted auditing procedure to the extent that, if it is omitted in an audit, disclosure must be made in the short form of an independent public accountant's report.

#### B. Analysis of Accounts Receivable

List of customers' balances open at end of period with amounts classified by age compared in detail with customers' ledger and reconciled with controlling account.

#### General Auditing Procedures

##### A. Confirmation

1. Positive or negative method.
2. Mail personally in envelopes bearing accountant's return address and enclose return envelopes addressed to accountant.

##### B. Analysis of Accounts Receivable

1. Examine composition of outstanding balances to see that payments are not just on current amounts in account.
2. Discuss disputed items that are past due with the credit department so as to form an opinion of the sufficiency of the reserve for bad and doubtful accounts.
3. See that bad debts written off have been approved by responsible authority.
4. Compare aging list with customer's ledger and reconcile with control account.

#### Detailed Audit Steps

##### A. Make inquiries into:

1. Trade discounts.
2. Cash discounts over 2%.
3. Freight allowed.
4. Customers' claims for price reduction and allowances for defective materials.

#### Generally Accepted Accounting Principles Involved

##### A. Balance Sheet

1. Credit balances in customers' accounts receivable should be included among the liabilities.
2. The reserve for bad debts should be shown as a reduction from the corresponding asset.
3. Goods consigned to customers for future delivery title to which has not yet passed to customers should be carried in inventory, not as accounts receivable.
4. Accounts receivable, including instalment accounts, of a substantial amount, maturing later than one year from the date of the balance sheet should be shown separately thereon unless trade practice warrants a different treatment.
5. Accounts receivable from stockholders, directors, officers, and employees and also accounts arising outside the ordinary business of the company should be shown separately on the balance sheet.
6. Deposits as security or guaranties and any other extraordinary items should be shown separately on the balance sheet.

7. Affiliates

8. Hypothecated or assigned

9. Reserve for discounts

7. Accounts receivable from affiliated concerns should in no case be included in customers' accounts receivable and may be shown as investments or otherwise but as current assets only if debtor has satisfactory current ratio.

8. Accounts receivable hypothecated or assigned should be so shown on the balance sheet.

9. A reserve is required for cash discounts over 2% and trade discounts not deducted from accounts receivable.

Another reorganized and reclassified program, the one for the Securities section, is given below:

"Key"

Chief Basis

Documentary evidence or confirmation

Auditing Procedures

1. List

2. Check list to ledger and to securities

Auditing Steps

1. In right name

2. Unmatured coupons intact

3. Income recorded

4. Brokers' advices

Accounting Principles

A. Balance Sheet

1. Marketable securities are current assets

2. Reserve for shrinkage

3. Investments

4. Reserve for shrinkage or disclosure on balance sheet

5. Treasury stock

6. Hypothecated securities

Audit Program for Securities

Chief Basis for Substantiating the Trial Balance Figure

Examination of securities, life insurance policies, or mortgages, or obtaining of confirmation if held by others. Also confirm mortgages if a significant proportion of total assets.

General Auditing Procedure

1. Obtain or prepare a list of securities showing pertinent details including cost, market, income received, and location.
2. Compare list both with ledger accounts and with securities themselves.

Detailed Auditing Steps

1. See that securities are in name of company or are so endorsed as to be transferable.
2. Examine coupons or bonds to ascertain that unmatured coupons are intact.
3. Ascertain that income per list has been properly recorded.
4. Examine brokers' advices for purchase and sale prices.

Generally Accepted Accounting Principles Involved

A. Balance sheet

1. Readily marketable securities representing temporary investment of surplus funds should appear on the balance sheet as current assets.
2. If market value of above securities is less than book value a reserve should be provided.
3. Securities representing control or having a value other than from their income should be carried under investments on the balance sheet.
4. If the market quotations, the examination of balance sheet and income accounts, or the information from officials indicates substantial shrinkage, reserves should be provided or the facts stated in balance sheet.
5. Treasury stock should be deducted from capital stock or surplus or both at either par or cost according to state laws. If acquired for specific purpose it may be classed as an asset but not as a current asset.
6. Hypothecated securities should be shown as such on the balance sheet.

With a certain amount of effort any serious student of accounting can restate under the proper headings the rest of the Institute's balance sheet audit program.

The effectiveness of this kind of statement of audit programs can be easily tested by its use in the classroom or by CPA candidates in preparing for the examination.

Inasmuch as the Institute's programs

are stated as minimums, the teacher or student might do well to consider such reclassified programs as an "irreducible minimum"; they can then be committed to memory. This would be a formidable task with the Institute's original wording, but no superhuman effort would be necessary with the newly reclassified sections of the audit program.

**Important announcement inside back cover.**

# THE ACCOUNTING EXCHANGE

A. C. LITTLETON

PUBLIC ACCOUNTANTS have had a growing conviction for some time that CPA laws are in need of carefully considered modernization. Now, after extended consideration in committee, the American Institute of Accountants has published a form of bill that state societies will find useful in planning new legislation.

*Leadership for Legislation.* In several particulars the bill reflects a progressive leadership which states would do well to follow. Emphasis is given to procedures that look to licensing public practitioners and restricting professional practice to them. Professional discipline is more directly provided for than is the case in present CPA laws. Noteworthy progress is made in showing a way of strengthening the educational basis of admission to the profession.

If public accounting is to be widely and effectively recognized as a real profession, it has need of statutory recognition of just such aspects as restriction, discipline, education. This will not imply that legislation can create a profession out of an occupation. A profession creates itself. Technical competence comes from study and experience only. The need of the public for technical services arises more from the complexities of business than out of legislation. And the most effective discipline is self-imposed.

Public accounting in this country has developed until it has come to serve an important public function. It has arrived at that point largely by its own efforts. Public accountants have created high standards of discipline and have educated themselves to high professional competence. Legislation along the lines of the Institute's bill therefore would merely

give statutory recognition to professional standards that already underlie public practice.

Restriction, however, can come only from laws enacted to protect the public interest. And there have been many circumstances in recent years which give point to the idea that it is public welfare, not occupational advantage, that requires the gradual imposition of restrictions upon the freedom of anyone to practice public accounting who wishes to hang out a shingle.

The bill has several sections dealing specifically with registration of foreign accountants, partnerships, certified public accountants, and public accountants. Since registration of the latter is provided for as of a single date to be named in the statute, future registrations, if this bill is followed, would presumably be limited to certified public accountants.

A number of sections cover in considerable detail the provisions relating to professional discipline: (1) naming of specific causes for revocation of certificate, suspension of registration, or refusal to renew the permit to practice; (2) stating certain acts that are declared unlawful, such as the unauthorized use of professional titles and the certification of a financial statement without a permit issued under the statute; and (3) outlining procedures for hearings in disciplinary cases before the board.

Teachers and students, however, will be most interested in the educational provisions of the bill.

The rules proposed for governing admission to the examination follow two broad principles. The first one is that the amount of practical experience required of an applicant should be decreased as

the amount of his formal and technical education increases.

For a college graduate who has at least twenty semester hours of accounting and at least ten hours of business law, economics, and finance, the experience requirement to receive a certificate is two years. For a college graduate who has not completed the stated minimum of technical education, the experience requirement is three years. For a high school graduate, the experience requirement is six years.

Flexibility and change in the use of the recommended bill are kept in mind. It is pointed out in comments accompanying the text: (1) that the Council of the Institute favors a gradual increase in the experience required of applicants who are without satisfactory college preparation; (2) that the simple omission of the section for high school graduates would set up graduation from college as a single educational requirement; (3) that the way should be left open for the Board to require other examinations in addition to the usual papers on practice, theory, auditing, and law.

With this pattern of legislation on the statute books, future amendments should be easy to secure as conditions change. Further improvement in the availability of formal technical education in state after state may suggest appropriate amendments to the basic CPA statute previously enacted. With the boards free to expand the subjects given in the examination, it is to be hoped that many will wish to break up the four-subject pattern established fifty years ago. For example, consideration may show that the examination on practice—four half-days—could with advantage consist of four parts, each one covering a designated area of subject matter. And the subject of finance and taxation could very appropriately be added to that part of the examination

devoted to theory, auditing, and commercial law; and to the section on practice, an optional section could be added devoted to aptitude tests. It is very likely that in due time this latter aspect of the CPA examination would prove so significant to the applicant and so useful to the employer that what began as an option would become a custom.

*Admission to Examinations.* The second principle of particular interest to teachers and students that is embodied in this form of legislation might be expressed this way: Practical experience in public accounting has come to be recognized as more important as preparation for public practice than as a way of preparing for written examinations.

This principle is reflected in the recommended provision that applicants who meet the stated requirements of technical education and graduation from college shall be entitled to be examined in theory, auditing, and law without having had prior practical experience. The examinations in accounting practice, however, would be open to these persons only after two years of accounting experience. No permit to practice would be issued without prior experience.

The idea of a state license to practice public accounting is not new. It was included in one of the proposals for CPA legislation that preceded the New York statute of 1896. It was revived in 1923 when Louisiana passed the first regulatory CPA law. Now the Institute places its prestige squarely behind the theory that a permit to practice is a desirable accompaniment to a CPA certificate.

Thus the certificate, being based upon a technical examination, becomes evidence that the holder has demonstrated a satisfactory standard of knowledge. And the permit, resting in effect upon other qualifications, tends to become evidence that the applicant has satisfactory practical ex-



perience and maturity to constitute a basis for professional good judgment, and satisfactory character to form a basis for professional integrity. Breach of any of these three professional qualities—knowledge, judgment, character—justifies disciplinary action as outlined in the statute and as provided by the common law dealing with professional negligence. A permit to practice, therefore, is a necessary part of the pattern of public recognition of the profession and public control in the general interest.

Some may feel that the law proposed would be stronger, and more in line with the regulations governing other professions, if the experience requirement (comparable to medical internship) could be fulfilled if desired after passing all parts of the CPA examination.

This view may rest in part upon the thought that a requirement calling primarily for maturity and experience as the principal basis for admission to a test of knowledge might upon occasion serve as a means of holding down a desirable growth in the number of people in practice. But it should be noted that if there is no restraint by licensing, any number of people can engage in public practice regardless of what hurdles are set up for becoming a CPA. And the opinion may not be unfounded that the public will learn the usefulness of expert accounting services more rapidly from the existence of many qualified and authorized practitioners than from the practice of a sharply smaller number. Unless adequate growth in the profession occurs, the demand for expert services is very likely so far to outrun the number of practitioners that the public interest may not be well served.

In plain terms, this country could use qualified public accountants in greater numbers than current net increases are likely to produce. How else explain the persistent growth of self-styled experts?

Is it not a fact that in 1913-1915 one important consideration, among others, tending to prevent Federal Reserve Board rules from prescribing certification of statements in support of commercial paper for rediscount was the lack of enough qualified public accountants to do the work?

In the committee's comments accompanying the text of the bill it was pointed out that the provision for admitting to parts of the examination without prior experience candidates with a stated preparation should be regarded as optional. It should be optional in the sense that omission of this provision need not affect the decision to use other sections of the bill. However it would be unfortunate if the comment should be construed as expressing a belief that such omission was generally desirable.

The possibility of separating practical accounting from the rest of the CPA examination, in the case of persons who have had adequate technical instruction in college, is one of the most constructive and progressive features of the bill. It introduces in a very sensible way an American application of the idea of an intermediate and a final examination. Such a separation might perhaps benefit the applicant somewhat by dividing his prior preparation. But even greater benefit would come to the profession as a whole and to the public from the encouragement thus given to otherwise capable men who find a single, hard examination exhausting, to say the least.

*Recognition of Schools.* When the educational requirements for admission to the CPA examination in a given state have been stated as in the Institute's form of CPA bill, the accountancy board of that state will need to determine the schools to be recognized. As more and more states adopt similar educational provisions, there will be increasing need for definite stand-

ards for judging a school. Large variations in these standards from state to state would not be in the public interest. Accountancy now stands so high in the matter of nationwide technical examinations that some way should soon be found to avoid unnecessary conflicts in the recognition of adequate educational programs.

Since other groups have had to face similar problems, accountancy may benefit by their experience.

Fifty years ago the medical profession was much concerned about conditions then prevalent in medical education. In 1904, the American Medical Association undertook a program of inspecting and rating medical schools. For this purpose, a permanent Council on Medical Education was formed. By the time of the first World War, most of the diploma mills were closed, and the better schools were under university supervision. In 1913, the American College of Surgeons was founded for the purpose, among others, of rating hospitals and establishing minimum standards for recognition by the College.

As an illustration of the scope of the rating service of the American College of Surgeons, the following requirements are quoted from a newspaper report of the fundamentals of good hospital care successfully met by three hospitals recently rated.

Modern physical plant, assuring the patient safety, comfort, and efficient care.

Clearly defined organization, duties, responsibilities, and relations.

Carefully-selected governing board with complete and supreme authority.

Competent, well-trained superintendent responsible to the governing board.

Adequate and efficient personnel, properly organized and competently supervised.

Organized medical staff of ethical, competent physicians and surgeons.

Adequate diagnostic and therapeutic facilities under competent medical supervision.

Accurate, complete medical records, readily accessible for research and follow-up.

Regular group conferences of the administrative staff and of the medical staff for reviewing activities and results so as to maintain a high plane of scientific efficiency.

A humanitarian spirit—the primary consideration being the best care of the patient.

Three questions about good hospital care underlie these requirements. Are the physical plant, equipment, and facilities adequate to the needs? Is the hospital staff satisfactory as to numbers and technical preparation? Are the size and spirit of the administrative staff appropriate? Plant, staff, and spirit are also important factors in the appraisal of accounting education.

College registrars have had considerable experience in establishing standards as a basis for appraising requests for transfer of graduation credit. The following are perhaps typical of the usual "criteria of a standard college."

A stated minimum enrollment; normal entrance requirements; satisfactory graduation requirements; minimum number of teaching departments; minimum educational attainment of teachers; satisfactory average level of teacher salary; suitable limits on size of classes and teaching load; adequate housing and equipment; budget adequate for existing staff, enrollment, and course offerings; suitable minimum library and funds for current growth; adequate minimum laboratory equipment.

Class A schools are those meeting all criteria in full. Class B schools fall short in certain particulars. Class C schools fall short in the more important particulars. Class D includes those which appear to be little more than secondary schools.

An approach is now being made to rating schools that give instruction in accounting. When an acceptable plan is worked out, the results should be useful to many CPA boards. In October, 1938,

the Council of the American Institute of Accountants adopted a resolution in favor of developing, in cooperation with educational bodies, minimum standards of curricula, finances, library, faculty, and equipment, by means of which judgment may be reached whether or not the work of a given school should be given approval. In June, 1945, at a joint meeting of the committees on education of the American Institute of Accountants and the American Accounting Association, a subcommittee was appointed, consisting of H. T. Scovill, chairman, W. A. Paton, F. H. Elwell, K. M. Montgomery, and T. W. Leland, for the purpose of studying the possibility of setting minimum standards for rating schools that prepare students to enter the accounting profession.

*Creation of Concepts.* An editorial in the *Wall Street Journal* of May 15, 1945, later reprinted in the *Journal of Accountancy*, deserves further circulation. Apropos of a recent statement by a United States Senator that "Congress is a force that is just as valid in fixing what is a cost accounting method as the practices of business," the *Wall Street Journal* says:

"Of course, accounting concepts cannot be fixed by law, nor are they arbitrarily created by accountants themselves or by business practices. Costs arise out of the highly complex operations of business just as the functions of all living bodies are due to the processes of nature. Accounting concepts and methods are merely the application of study and experience in dealing with these costs and they are subject to change and improvement as knowledge progresses. To endeavor to fix them by law or any other method is as absurd as to enact that the surgeon shall cut thus far and no further, the physician prescribe only a particular dosage for any ailment."

The theme merits development. The above statement of one hundred words would make a good introductory paragraph. Recipe for an article in any accounting periodical: Multiply the introduction by fifty and mail.

*Some Questions About Regulation.* The rates charged consumers of electric power and the return allowed investors in utility company securities are matters of public interest because so many people are directly concerned. And since a shift in policy seems to be in the making—from reproduction cost to original cost in the rate base—a wide discussion of the issues is in order.

Although questions of price-making and economic policy are not in themselves the concern of accountants, the use of accounting methods and data in reaching decisions in these areas is common enough to give accountants an interest in the questions involved. When discussion is joined about accepted accounting principles or established accounting concepts, accountants will naturally have views to express.

The several queries that follow are formulated with the thought that they may promote discussion and thus help to crystallize opinion into good judgment.

Since accounting is avowedly pragmatic, why is it so difficult for people to see that original cost is a workable and practical approach to rate problems, whereas reproduction cost and other valuation estimates are extremely time-consuming in actual use and the results obtained by value studies show such wide disparity as to be almost futile?

If we must abandon "value" as the basis of commission-determined rates—as apparently we must, since use of that basis in the past has not proved to be in the public interest—and in place of it must follow statutory directives to use actual legitimate cost, where can the cost base come to rest except on actual construction cost to the original owner plus expenditures on subsequent new and additional construction? Where is there a stopping place for a price-regulated enter-

prise along the road of intangible values, however one may differentiate real and fancied intangibles?

Will the profession of public accounting make a greater social contribution by giving its support to, or by voicing sharp criticisms of, public agencies, when the activities of those agencies are conditioned by the fact that the agencies are charged by statute (after extended Congressional investigations) with the duty of creating conditions designed to prevent financial practices which in the past were clearly contrary to the public interest, and when the formal orders of the agencies are always subject to review by courts that invariably hold administrative agencies strictly within their statutory authority?

Since administrative agencies of the government are expected to act in the public interest and by statutory authority, is there not an implied obligation for them to go further than establishing rules, issuing legalistic orders of compliance, and seeking to enforce them against the companies through court action—a democratic obligation to foster public discussion of the meaning of the issues involved and the effects of the rules proposed, to the end that public opinion may be as well informed in the present, while the statutes are being put in operation, as it was in the past when the need for legislation was being considered?

If we can say with conviction that bargaining as to a price and dealing at that price lodged in men's minds long ago a conception of actual legitimate cost beyond the power of legislative enactments and regulatory rules to change, does it not follow that a direct attack upon the procedures by which price was in fact determined in specific cases will be likely to produce better results than an attack on the accepted conception of cost-price itself?

If the intangible values included in the purchase price of a property have derived from expected high earnings, and if the earnings do continue to be high, how can it be reasonably argued that there was no justifiable basis for the price paid? If earnings are reduced through a rate reduction, how can anyone successfully argue that intangible values resting on high earnings still attach to the property? How can an asset price be attacked as excessive (actual fraud and planned deceit excepted) until its presumed base in high earnings is demonstrably absent?

Was the account breakdown of public utility acquisition cost intended from the first to be a means of securing the ultimate elimination from assets of all values other than cost to the first owner, whereas the account system was originally supported principally by contentions that the proposed segregation was necessary to a proper depreciation accounting and that the subdivided asset figures were needed for checking the correctness of appraised reproduction costs?

With the courts as referee on the issue of turning from a long-established value rate-base to a newly conceived cost rate-base, is it not natural, even necessary, that someone shall act as an advocate for the consumer while another acts as advocate for the investor? But is it inevitable that each of the contending advocates shall take an extreme position in order to influence the compromise? Is it sensible to argue either that any price passed between two parties is a mark of legitimate cost, or that no price passed between closely associated parties can be a mark of legitimate cost?

Since the issue between utility commissions and utility companies is basically a social one of price-making outside competition, does an assertion that the price (or the price-base) can be affected by accounting policy (i.e., classifying-and-



reporting policy) have sufficient force to convert the views of accountants regarding the limited nature of accounting policy and practice into views that express prejudice against social reforms?

If it is in the public interest that isolated or local power systems should be integrated as to management and interconnected as to power load, is it not wholly reasonable (1) to believe that all cost prudently incurred in creating integration and interconnection, being recognized as quite different from goodwill based on estimated high earning power or public favor, is a continuing asset so long as the public benefit of that integration continues in effect; and (2) to consider that public benefits such as are conferred by integration fully justify an income return to the investor and a service charge to present and future consumers?

If a company can show that the price of a property set by purchase and sale within a scheme of related companies, or determined at the time of a reorganization, had in fact a reasonableness as of that time comparable with a price determinable by fully independent bargaining parties, what prevents such a price from being an actual legitimate cost as of the transaction date? And if the same surrounding conditions continue into the present, what reasoning would be necessary to justify special amortization of part of the price?

If it is in the public interest to check the practice of making fictitious deals which cover up the existence of high earning power coming from the use of improved industrial technology and managerial skill (thus denying to consumers a share in the economies), is it also in the public interest to enforce rules and penalties which have the effect of discouraging the purchase and sale of power properties (such integration of companies being an important ap-

proach to improving service to consumers)?

Does full expiation for stock watering and overvaluation of properties in the past require, in addition to the elimination of asset write-up, the denial to investors of all profit benefits flowing from managerial initiative, cost reduction, ingenuity in development, and useful integration, and the transfer to consumers by lower rates of all such benefits as monopoly-derived excesses?

If there are both efficient and inefficient operators of power companies, and if some companies serve rapidly growing markets for current while others serve more or less static markets, will the regulation of rates through blanket rules or accounting formulae give all operators a suitable return without penalizing either the low-cost producer or the high-cost producer?

When and if, as an enforced accounting policy, integration costs actually incurred are removed from the property account and subsequently written off, what is to follow then? A change in the rate structure? A modification of the return to investors? A call for contributions to capital surplus to make good the amount written off?

If all benefit of increments of value accruing from the past is denied to investors through present-day, enforced amortization of some part of property accounts, will investors in the future willingly furnish the capital needed for the continued development of the power industry, while risking another later denial of benefit from subsequent increments of value? If private risk-capital, as a result of fear of the future, is not forthcoming in adequate quantities, will government money from taxation and public borrowing flow into the vacuum created by prior action of government agencies and Federal statutes?

**Important announcement inside back cover.**



# PROFESSIONAL EXAMINATIONS

## A Department for Students of Accounting

HENRY T. CHAMBERLAIN

THE FOLLOWING problems were prepared by the Board of Examiners of the American Institute of Accountants and were presented as the second half of the C.P.A. Examination in accounting practice held in May, 1945. The examinees were allowed four and a half hours to solve both problems. Each problem was given a weight of 25 points. A suggested time schedule is given below:

Problem 1	75 minutes
Problem 2	120 minutes

### No. 1

From the information following, prepare as of September 30, 1944 (a) summary statement of executors as to principal, showing assets remaining in the estate and (b) summary statement of executors as to income of the estate of Ben East, deceased.

Ben East died July 7, 1943. His will appointed two executors to administer his estate and provided for the payment of funeral and other necessary expenses and of general bequests, namely \$10,000 to Cemetery on The Mount; \$15,000 to PMW, a sister; and to each executor, \$5,000 in lieu of fees.

The testator at date of death was possessed of the following: cash \$52,000; accounts receivable \$18,000; non-interest bearing notes receivable \$10,000; first mortgage bonds 6%, interest J1 and J1, principal amount \$8,000 and appraised value \$6,500; U. S. Savings Bonds, 3% interest J15 and J15, par value \$100,000, appraised value, \$101,500; 5,000 shares of Shell Mining Co., no par value, cost \$50,000, appraised as valueless; 1,000

shares of Atlas Amusement Corp., par value \$100, appraised at \$102 per share; semi-precious stones \$5,280; clothing \$1,375; furniture \$7,500.

A summary of cash transactions from July 7, to September 30, 1944 is presented as follows:

Cash receipts:	
Accounts receivable collected (remainder uncollectible).....	\$15,000
Proceeds—sale of \$70,000 U. S. Savings bonds on January 15, 1944 at \$102 without interest.....	71,400
Dividends:	
\$2.50 per share of Atlas Amusement Corp. declared payable to stockholders of record on July 5, 1943 and paid July 25, 1943.....	2,500
\$2.50 per share of Atlas Amusement Corp. declared payable to stockholders of record January 5, 1944 and paid January 25, 1944.....	2,500
Proceeds—5,000 shares of Shell Mining Co. Co. at 10¢ per share.....	500
Refund of 1943 overpayment of U. S. income tax (declaration tax paid \$5,725, actual tax payable \$5,350).....	375
Proceeds—sale of furniture.....	5,150
Other transactions—short-term notes collected at maturity; interest on all investments collected.	
Cash disbursements:	
Funeral expenses, etc.....	\$1,750
Administration expenses (Corpus \$5,250; Income \$1,250).....	6,500
Legal and accounting services incident to probating will.....	3,750
Debts of testator.....	14,450
U. S. Treasury Dept.—tax deficiency, 1940 and interest thereon, \$72.....	522
Playa Co. 4½% bonds—\$20,000 acquired on August 15, 1943, at \$101 and accrued interest (interest dates March 15 and September 15).....	20,575
Short-term notes—\$5,000—6% short-term notes purchased on January 16, 1944 at 100½ interest January 15 and July 15, maturing in six months from date of purchase.	
Other transactions—general bequests paid in full, PMW taking semi-precious stones at appraised value to apply against bequest of \$15,000.	
Other transactions—clothing given to charity.	

## No. 2

From the following information, concerning Dart Co., prepare a statement showing the estimated cost of producing 13,500 tons of X product for the purpose of bidding on a government contract.

Dart Co. manufactures X, a main product, and Y, a by-product. X is produced and sold by the ton (2,000 pounds.) The raw material used in production consists of three ingredients, "H," "I," and "J," contained in both the finished main and finished by-product in proportions and at estimated costs per ton set forth below:

"H"—40% at \$8 per ton  
 "I"—36% at \$5 per ton  
 "J"—24% at \$7 per ton

The contract for 13,500 tons of X represents 60% of the budgeted 1945 production of X by Dart Co.

Main-product X is manufactured through four processes, as follows:

Process No. 1—Ingredients "H" and "I" are issued at the outset of process No. 1; completed work in process is transferred to process No. 2.

Process No. 2—Ingredient "H," at the end of process No. 2, suffers a 5% weight loss due to evaporation and 10% of the remaining work in process is sold as waste at a nominal amount of \$6 per ton; completed work in process is transferred to process No. 3.

Process No. 3—Ingredient "J," at the outset of process No. 3, is mixed with work in process. Ingredient "J" loses 4% of its original weight due to evaporation at the end of process No. 3.

Process No. 4—In this final process, the ma-

terial is separated into main-product X and by-product Y in the proportions of 80% and 20%, respectively, and such products are placed in salable form.

Estimated direct labor per ton by processes is as follows:

Process	Direct labor per ton
No. 1.....	\$5.00
2.....	2.50
3.....	3.00
4.....	4.00

Manufacturing overhead expense at normal capacity, i.e., 75% of a total plant capacity of 25,000 tons annually of X, is as follows:

Process	Variable	Fixed	Total
No. 1.....	\$ 60,000	\$30,000	\$ 90,000
2.....	62,000	18,000	80,000
3.....	50,000	20,000	70,000
4.....	40,000	16,000	56,000
Total.....	<u>\$212,000</u>	<u>\$84,000</u>	<u>\$296,000</u>

At the normal capacity level, general manufacturing overhead expense applicable to the factor as a whole amounts to \$60,000, of which 40% is fixed.

It is expected that the units called for by the government contract, coupled with the company's curtailed civilian production during 1945 will reach 90% of total-plant capacity measured in finished units of product X.

Product Y is expected to sell for an estimated \$20 per ton, before deduction for handling, selling and administrative expenses of \$2.50 per ton.

Carry all computations to two decimal places.

## Solution to Problem 1

(1)	
Cash.....	\$ 52,000.00
Accounts receivable.....	18,000.00
Notes receivable—non-interest bearing.....	10,000.00
1st mortgage bonds 6%.....	6,500.00
Accrued interest receivables on mortgage bonds.....	9.24
U. S. Savings bonds.....	101,500.00
Accrued interest receivable on U. S. Savings bonds.....	1,422.06
Stock in Shell Mining Co. (5,000 shares).....	
Stock in Atlas Amusement Corp. (1,000 shares).....	102,000.00
Semi-precious stones.....	5,280.00
Clothing.....	1,375.00
Furniture.....	7,500.00
Estate corpus.....	\$305,586.30
To set up inventory.....	
(2)	
Dividends receivable—Atlas Amusement Corp.....	\$ 2,500.00
Estate corpus.....	\$ 2,500.00
To set up asset not inventoried.....	
(3)	
Claim for refund of Federal taxes.....	\$ 375.00
Estate corpus.....	\$ 375.00
To set up asset not inventoried.....	
(4)	
Estate corpus.....	\$ 35,000.00
Legacy—Cemetery on The Mount.....	\$ 10,000.00
Legacy—PMW.....	15,000.00
Legacy—Executor A.....	5,000.00
Legacy—Executor B.....	5,000.00
To set up legacies.....	
(5)	
Legacy—PMW.....	\$ 5,280.00
Semi-precious stones.....	\$ 5,280.00
To record partial payment of legacy.....	
(6)	
Estate corpus.....	\$ 1,375.00
Clothing.....	\$ 1,375.00
To record clothing given to charity.....	

Cash Records  
Cash Receipts

	General	Gain or	Principal	Income	Total
Balance per inventory.....	\$ 52,000.00		\$ 52,000.00		\$ 52,000.00
Accounts receivable.....	18,000.00	*\$3,000.00	15,000.00		15,000.00
U. S. Savings bonds.....	71,050.00	350.00	71,400.00		71,400.00
Dividend receivable—Atlas.....	2,500.00		2,500.00		2,500.00
Dividend income—Atlas.....	2,500.00			\$2,500.00	2,500.00
Shell Mining Co. stock (5,000 shares).....		500.00	500.00		500.00
Claim for refund of Federal taxes.....	375.00		375.00		375.00
Furniture.....	7,500.00	*2,350.00	5,150.00		5,150.00
Short term notes.....	5,025.00		5,025.00		5,025.00
Interest on short term notes, less premium..	125.00			125.00	125.00
Accrued interest receivable—U. S. Bonds.....	1,422.06		1,422.06		1,422.06
Interest income—U. S. Bonds.....	2,027.94			2,027.94	2,027.94
Accrued interest receivable—mortgage bonds	9.24		9.24		9.24
Interest income—1st mortgage bonds.....	470.76			470.76	470.76
Accrued interest receivable—Playa Co.....	375.00		375.00		375.00
Interest income—Playa Co.....	975.00			975.00	975.00
	<u>\$164,355.00</u>	<u>*\$4,500.00</u>	<u>\$153,756.30</u>	<u>\$6,098.70</u>	<u>\$159,855.00</u>

# Professional Examinations

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## Cash Disbursements

	Principal	Income	Total
Funeral expenses, etc.	\$ 1,750.00		\$ 1,750.00
Administration expenses	5,250.00	\$1,250.00	6,500.00
Legal and accounting services	3,750.00		3,750.00
Debts of testator	14,450.00		14,450.00
U. S. Treasury Dept.—tax deficiency, 1940 and interest	522.00		522.00
Playa Co. 4½% bonds (20,000.00 acq. 8/15/43 at 101)	20,200.00		20,200.00
Accrued interest receivable on Playa Co. bonds	375.00		375.00
Short-term notes 6% (5,000.00 acq. 1/16/44 at 100½)	5,025.00		5,025.00
Legacy—Cemetery on The Mount	10,000.00		10,000.00
Legacy—PMW	9,720.00		9,720.00
Legacy—Executor A	5,000.00		5,000.00
Legacy—Executor B	5,000.00		5,000.00
	\$ 81,042.00	\$1,250.00	\$ 82,292.00
Balance	72,714.30	4,848.70	77,563.00
	<u>\$153,756.30</u>	<u>\$6,098.70</u>	<u>\$159,855.00</u>

## Estate of Ben East Deceased, A and B, Executors Summary Statement as to Principal July 7, 1943 to September 30, 1944

The executors are accountable for the following:

Assets, per inventory, July 7, 1943:

Cash	\$ 52,000.00	
Accounts receivable	18,000.00	
Notes receivable—non-interest bearing	10,000.00	
1st mortgage bonds 6%—appraised value	6,500.00	
Accrued interest receivable on mortgage bonds	9.24	
U. S. Savings bonds, 3%—appraised value	101,500.00	
Accrued interest receivable on U. S. Savings bonds	1,422.06	
Stock in Shell Mining Co. (5,000 shares)	no value	
Stock in Atlas Amusement Corp. (1,000 shares) appraised	102,000.00	
Semi-precious stones	5,280.00	
Clothing	1,375.00	
Furniture	7,500.00	\$305,586.30

Assets subsequently discovered:

Claim for refund of 1943 Federal taxes	\$ 375.00	
Dividend receivable—Atlas Amusement Corp.	2,500.00	2,875.00
Total		<u>\$308,461.30</u>

The executors credit themselves with the following:

Funeral expenses	\$ 1,750.00	
Administration expenses	5,250.00	
U. S. Treasury Dept.—tax deficiency and interest, 1940	522.00	
Legal and accounting services	3,750.00	
Debts of testator	14,450.00	
Net loss on disposition of corpus assets:		
Uncollectible accounts receivable	\$ 3,000.00	
Loss on sale of furniture	2,350.00	
Clothing given to charity	1,375.00	
	<u>\$ 6,725.00</u>	
Less: Gain on sale of U. S. Savings bonds	350.00	
Proceeds of sale of Shell Mining Co. stock	500.00	
	<u>\$ 850.00</u>	5,875.00

Legacies paid:

Cemetery on The Mount	\$ 10,000.00	
PMW	15,000.00	
Executor A	5,000.00	
Executor B	5,000.00	35,000.00

Total

Balance of assets on hand, September 30, 1944	<u>\$66,597.00</u>	<u>\$241,864.30</u>
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The balance is composed of the following:

Cash.....	\$ 72,714.30
Notes receivable—non-interest bearing.....	10,000.00
1st mortgage bonds, 6%—appraised value.....	6,500.00
U. S. Savings bonds, 3%—appraised value.....	30,450.00
Stock in Atlas Amusement Corp. (1,000 shares) appraised value.....	102,000.00
Playa Co. 4½% bonds, at cost.....	20,200.00
	<u>\$241,864.30</u>

*Estate of Ben East, Deceased, A and B Executors*  
*Summary Statement as to Income*  
*July 7, 1943 to September 30, 1944*

The executors are accountable for the following:

Dividend from Atlas Amusement Corp.....	\$ 2,500.00
Interest on U. S. Savings bonds.....	2,027.94
Interest on 1st mortgage bonds.....	470.76
Interest on Playa Co. bonds.....	975.00
Interest on short term notes.....	\$150.00
Less amortization of premium.....	25.00
	<u>125.00</u>
Total.....	<u>\$ 6,098.70</u>

The executors credit themselves with the following:

Administration expenses.....	\$ 1,250.00
Total.....	<u>\$ 1,250.00</u>

Balance of cash on hand, September 30, 1944..... \$ 4,848.70

NOTE: Premium on Playa Co. bonds should be amortized as a charge to income. The problem does not give sufficient information to compute this adjustment.

### Solution to Problem 2

13,500 T of product X will result in a total production of main product and by-product of 13,500 T ÷ .8 or 16,875 T

16,875 T = 6,750 T of H  
                   6,075 T of I  
                   4,050 T of J

Material requirements:

Raw material H:

The amount of H transferred to Department 3 is 6,750 T. The amount of H in Department 2 before waste loss is 6,750 ÷ .9 or 7,500 T. The amount of H started in production is 7,500 ÷ .95 or 7,894.74 Tons.

Raw material I:

The amount of I transferred to Department 3 is 6,075 T. The amount of I started in production is 6,075 ÷ .9 or 6,750.

Raw material J:

The amount of J in the finished production is 96% of the amount started in production. The amount started in production is 4,050 ÷ .96 or 4,218.75 Tons.

*Dart Co.*

*Schedule of Estimated Raw Material and Direct Labor Cost*  
*of Producing 13,500 Tons of Product X*

*Department 1*

Raw material H.....	7,894.74 tons @ \$8.00	\$ 63,157.92
Raw material I.....	6,750.00 tons @ \$5.00	33,750.00
Direct labor.....	14,644.74 tons @ \$5.00	73,223.70
		<u>\$170,131.62</u>

*Department 2*

Raw material and direct labor cost from Dept. 1.....	14,644.74 T	\$170,131.62
Evaporation loss.....	* 394.74 T	
Sale of waste at \$6.00 per ton.....	* 1,425.00 T	8,550.00
		<u>12,825.00 T</u>
Direct labor—12,825 tons @ \$2.50 per ton.....		161,581.62
		<u>32,062.50</u>
		<u>\$193,644.12</u>



# Professional Examinations

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## Department 3

Raw material and direct labor cost from Dept. 2 .....	12,825.00T	\$193,644.12
Raw material D .....	4,218.75T	29,531.24
Evaporation loss .....	168.75T	
	<u>16,875.00T</u>	<u>\$223,175.37</u>
Direct labor—16,875 tons at \$3.00 per ton .....		50,625.00
	<u>16,875.00T</u>	<u>\$273,800.37</u>

## Department 4

Raw material and direct labor cost from Dept. 3 .....	16,875.00T	\$273,800.37
Direct labor—16,875 tons @4.00 per ton .....		67,500.00
	<u>16,875.00T</u>	<u>\$341,300.37</u>
By-Product Y at net sales value of \$17.50 per ton .....	3,375.00T	59,062.50
Raw material and direct labor cost of product X .....	<u>13,500.00T</u>	<u>\$282,237.87</u>

## Dart Co.

### Statement of Estimated Cost of 13,500 Tons of Product X

Raw material and direct labor costs (See Schedule) .....	\$282,237.87
Manufacturing overhead—fixed (60% of \$84,000.00) (Note 1) .....	50,400.00
Manufacturing overhead—variable (60% of 120% of \$212,000.00) .....	152,640.00
General manufacturing overhead—fixed (60% of \$24,000.00) .....	14,400.00
General manufacturing overhead—variable (60% of 120% of \$36,000.00) .....	25,920.00
	<u>\$525,597.87</u>

NOTE 1. The expected production is 22,500 tons of X and the government contract of 13,500 tons of X is equivalent to 60% of the expected production.

NOTE 2. The expected production is 120% of the normal production of 18,750 tons of X and the government contract is 60% of that amount.

NOTE 3. The problem is not clear with respect to the departmental direct labor cost. In this solution the cost per ton was applied to total production finished in each department irrespective of the fact that part of the production became by-product. It would be equally proper to assume that the labor cost per ton applied to the number of ton started in a department.

## BOOK REVIEWS

*Internal Auditing—Philosophy and Practice.* Institute of Internal Auditors. (Stamford, Connecticut: Brock & Wallston, 1944. Pp. xvi, 249.) \$2.50

"Internal Auditing: Philosophy and Practice" was published in 1944 by the Institute of Internal Auditors. It follows the first book published by that Institute entitled, "Internal Auditing: A New Management Technique." Both books represent a symposium of papers and speeches pertinent to the subject, delivered, for the most part, by members of the new organization—Institute of Internal Auditors. This new organization was formed in 1941 to foster and to make articulate a new profession—that of internal auditor.

The foreword points out that the ideas expressed are those of the authors and are not necessarily those of the Institute.

As a result of its youth, the objectives of the profession are not too well defined and there is much groping and contradiction in the papers in an effort to find their niche in the world. This particular book will provide one interested in internal auditing activities with a knowledge of the thought processes and aspirations of that group. It is not a textbook in any sense of the word, but students of accounting would do well to read it as collateral reading. It would be more effective in accomplishing the objectives of the Institute if the sections on philosophy could be placed before senior management of those companies with internal auditing staffs.

The papers have been well written and are satisfying. The preface, written by the 1943 president of the Institute, lists the accomplishments from the inception of the organization to date. One wonders, in the light of assertions throughout the discussions in the book concerning broad intellectual attainments requisite for the profession, why no relationships have been established with university colleges of business administration.

Philosophy and Practice of Internal Auditing is divided into six sections. Section one is concerned with internal auditing techniques. It consists of four papers on "The Functions of the Internal Auditor," "Manuals and Working Papers for Internal Auditors," "Role of the Internal Auditor in Development and Installation of Company Procedures," and "Safeguarding the Assets of Our Institutions."

The first paper states that the auditing department's job is to do two things: (1) See that the operations of the company are being performed as the executives want them to be, and (2) work closely and in cooperation with the Public Accountants. The second paper suggests the development of internal auditing manuals to supplement accounting manuals. There is a rather incomplete outline of working papers. The third paper is in defense of the statement that the role of the internal auditor should not be that of a systems man. The last paper in the first section, on safeguarding the assets of a bank, contains as a conclusion a statement (perhaps intended to be facetious but which contains more truth than poetry many times), which is similar in part to

some descriptions one sees of cost accountants—management wants supermen with the pay of clerks. The statement follows: "The auditor should be an accountant, a lawyer, an income tax expert, a psychologist, a news hound and work horse, and an inveterate reader of every good banking periodical."

The second section is on internal auditing and its relationship to business management. It consists of six papers. The first paper concludes that the internal auditing department is one of the finest training grounds in the company for any type of executive or administrative position." Many firms are now successfully using it as such. The second paper is concerned with the growth of internal auditing departments and how they may be sold more effectively to management. The third paper is on the effect of management policies on the activities of the internal auditor. It points out that the work of the department must be well defined if it is to function most effectively. The last two papers in the section deal with the relationship of the internal auditor to stockholders and directors and represent him as an internal management engineer. The section concludes with a statement from a representative of management on the human aspects of auditing.

Part three of the book deals with the relationship between the internal auditor and the public accountant. The consensus of opinion seems to be that the internal auditor can be of great help to his company and its public accountants by providing those public accountants with complete descriptions of procedures followed and by making available to them if they so desire complete working papers on work done.

The fourth section is devoted to a very interesting discussion of the viewpoint of the Securities and Exchange Commission on internal auditing. The author—the chief accountant for the Commission—cites numerous instances in which an adequate internal auditing staff would have established internal controls and checks which would have prevented fraudulent practices and losses later disclosed. He points out, however, that the public accountant should not lose his independence and unbiased attitude by depending too much on the work and help of the internal auditing staff.

Part five is concerned with internal auditing and wartime problems as they existed at that time. It is hoped that procedures such as are discussed and described in that section will not become a permanent part of our economy. The value of the section lies in the realm of history and, whereas contract terminations are very important today, the procedures described in this section have been and are subject to change.

The concluding section is one of the most thought-provoking to one interested in the future possibilities for the internal auditor and in the problems which he faces. The last article points out four very important obstacles, from the standpoint of recognition, which face the internal auditor. These are listed as the "misnomer"—internal auditing is much broader and more important in

scope than the term implies; the lack of understanding of the function; the illogical position of the auditor in the administrative organization setup; and the fact that management itself is in a transition period—that there is no such thing as a “science” of management.

MERRILL BOYD DILLEY

Eastman Kodak Company  
Rochester, New York

Andrea Barbarigo, *Merchant of Venice, 1418-1449*.  
Frederic C. Lane. (Baltimore: The Johns Hopkins Press, 1944. Pp. 224. \$2.25.)

This study is properly called a business biography. The materials which Professor Lane consulted are the letters and books of account of Andrea Barbarigo, of various of his business contemporaries and associates, and of Andrea Barbarigo's heirs. There seem to have been both a primary and a secondary aim in presenting this little volume. Says the author: “I am not concerned, as is the true biographer, with the individual for his own sake and with his whole personality. I am interested in the individual as a means of interpreting certain institutions of his time. . . . One reason why business records are of special value as sources for the historian is that they show the connection between the institutions and the individual” (p. 4). The secondary aim of the author seems to have been to add a footnote to, if not to correct, received history of double entry bookkeeping.

Andrea Barbarigo and his heirs were really not important figures in the history of the Venetian republic, either in the political or in the commercial realm. In fact, had the Barbarigos been important political figures, a history of their business transactions would be both drab and uninformative; and had these people been members of an established commercial family it is likely that the recorded transactions would have reflected quite inadequately the economic temper and climate of the times. Andrea Barbarigo was an independent merchant who sought through wide and varied trading operations to recoup the fortune which his father had lost. To such men as Andrea Barbarigo the state was an ever-present and an all-powerful conditioner of the way in which they operated. As Professor Lane states it, the business transactions of these independent merchants reflect most clearly “the kind of mercantile calculation and behavior favored by contemporary conditions” (p. 5).

The general excellence of the journals and ledgers kept by Andrea Barbarigo has long been recognized. Pages from these books have been reproduced in various histories of accountancy to prove that the art of keeping accounts by the double entry system has been practiced long enough to be respectable, and has been serviceable to society long enough to warrant serious inquiry into its origins. “The historians of accounting,” however, says Professor Lane, “have not understood the business problems.” As a consequence, he continues, “in order to use the account books as sources of this study I have had to re-examine the history of double entry” (p. 153). On the basis of Professor Lane's study there is good reason to assert that the Barbarigo books were not kept according to strict double entry principles.

But Professor Lane apparently wants to avoid such a conclusion. He suggests that the reliability of his study might be impugned if the Barbarigo books did not carry the double entry insignia; in any case, Professor Lane does speak of the necessity of “qualifying the witnesses whose testimony is to be taken” (p. 153). Surely we have not arrived at the place where credible conclusions can be derived only from the investigation of business records which have been kept according to the double entry scheme.

On the other hand, too, it is possible that Professor Lane does not himself possess too clear a concept of all that is embraced within the idea of double entry. He does not, for instance, indicate that he has consulted Professor Littleton's *Accounting Evolution to 1900* for the view presented there of the content and meaning of this hard-to-define term. Nowhere does Professor Lane indicate what he considers to be the minimal requirements or earmarks of a double entry system. The difficulty of terminology is pointed up by certain facts disclosed by the study. The trial balances (*conto saldo*) which Andrea Barbarigo is said (p. 173) to have abstracted from his ledgers were taken at most irregular intervals; these trial balances did not balance (a fact which did not seem to indicate to Andrea that anything was wrong with his bookkeeping processes); and these trial balances were used only (with possibly one exception) for the sole purpose of transferring account balances to new ledgers. Can the Barbarigo books really be said to have been kept in accordance with double entry principles? Furthermore, one wonders what Professor Lane means when he suggests that Andrea Barbarigo must have used a work sheet “to secure from his *conto saldo* a simpler statement of his assets and liabilities” (p. 178). Surely it is not usual to think of a trial balance as a complex statement of the assets and liabilities of an enterprise.

All in all, Professor Lane has made a good case for the proposition that the history of double entry needs to be re-examined. Either Andrea Barbarigo's accounting procedures did not measure up to the best standards of his time, or the theory and practice of accounting progressed rapidly between 1449 and 1494. If the latter be the case, then it may be that Luca Pacioli was a more original thinker than he is currently assumed to be. But whatever the final judgment upon the need for re-examination of the history of double entry, or even whether Andrea Barbarigo kept an acceptable double-entry set of books, the excellence of this business biography is dimmed not a bit.

RAYMOND C. DEIN

University of Arkansas

*Excess Profits Tax Relief: The Cyclical Provisions*.  
Joseph L. Snider. (Boston: Harvard University Graduate School of Business Administration, Division of Research, 1944. Pp. iv, 30. \$1.50.)

The importance of excess profits tax relief stemming from Section 722 of the Internal Revenue Code has brought a flood of literature, much of which is couched in vague terms, merely rewording the Treasury Regulations and rulings. This study is definitely not of this

type, for it analyzes carefully that subsection which provides relief on cyclical grounds.

The first part of the study is a critical examination of two relief claims which have been filed. The author points out that the law requires that earnings of the taxpayer and the industry must be depressed in the base period (1936-1939) before relief can be granted and that data on sales and production prove nothing about earnings. This may be correct, but earnings data for the industry of which the taxpayer is a member may be exceedingly difficult to obtain. The *Statistics of Income* (U. S. Treasury Department) figures are for broad classifications of industries, and corporate reports may not be available for any other corporations in the same industry. Production data may be the only evidence as to earnings that can be obtained.

The second part of the study is an analysis of the principal questions involved in the interpretation of the cyclical provisions of the law. The author points out that the even cyclical fluctuation of business in general is due to the averaging of many industries and many companies, and that this same smoothness cannot be expected for the individual company. The difficult question as to whether a company with a short life can be entitled to relief is answered in the negative, but if this is correct, a substantial inequity will be present unless these taxpayers are granted relief on the grounds that they commenced business "immediately prior to the base period." That earnings history of the taxpayer should be adjusted for capital changes but not for growth without capital changes is another conclusion. This also would result in discrimination.

Perhaps the most useful part of the study is an analysis of the *Statistics of Income* data from 1922 to 1939. These data are not homogeneous, and most of the early claims for relief will probably now need correction. What basis is to be used is a debatable matter, and one on which the author and the Bureau of Internal Revenue disagree. The conclusion reached in the study is that interest on all government obligations owned should be included in income and dividends received from domestic corporations should be excluded. An adjustment should then be made for changes in equity capital with the result that earnings for 1936-1939 are 20 per cent above the 1922-1939 average. The Bureau of Internal Revenue finds that 1936-1939 earnings are not above the 1922-1939 level. This is merely one of the many issues which will ultimately be settled by the Tax Court. Accountants with a flair for statistics and economics will find the road to tax relief much easier than the accountant not so versed, but both groups should find studies such as this one of very great value.

CARL L. NELSON

University of Nebraska

*Here Comes Tomorrow.* A. W. Zelomek. (Chicago: Ziff-Davis Publishing Company, 1944. Pp. v, 127. \$2.00.)

*Here Comes Tomorrow*, subtitled, "An Economist's Forecast for the Next Ten Years," is an interesting departure in the field of business writing. It represents a two-way expansion of the business newsletter—a quantitative expansion and an expansion with reference to

the time factor. Zelomek treats the next ten years much as the Washington business correspondent deals with the next ten days—concretely and specifically.

Since the book is interpretative and predictive in character, a word should be said about the author and his point of view. Zelomek identifies himself as a practicing economist, "the economist who works at his trade in the business world," as distinguished from the academic branch of the profession. In his introduction, however, he seems to be even more ambitious than the college economist when he assigns to economics virtually the whole of social science. The introduction is unfortunate in that it may prejudice many readers, both academic and otherwise, by reopening the old theory *versus* practice argument in such a way as to cause one to question the author's grasp of the methodology of social science. On the other hand, Zelomek's experience, both in business and in government service, should give him the perspective necessary for formulating his commentary on the shape of things to come. This he does with vigor in fact-filled pages which go a long way toward filling the gaps with reference to the happenings of the late 'thirties and early 'forties—the period which has been classed as "too late for news and too early for history." Against this background, the trends of the future are sketched and analyzed.

The first five chapters are devoted to postwar world relief needs, reconversion, postwar employment, price trends and monetary problems, and taxation and government spending. The analysis produces few new viewpoints, but a very definite contribution is made in the bringing together of facts and expert opinion on these subjects. These chapters are excellent for orienting those who have been unable to keep up on socio-economic events as they have happened during these hectic years.

Chapters six and seven deal with the American home in terms of both its physical and institutional characteristics. Zelomek believes that our desires for postwar housing units have outrun our physical and economic possibilities, but that home equipment and appliances will flow from our assembly lines in great quantity and that such items will be available at reasonable prices. It is in connection with this discussion of the home and the family that *Here Comes Tomorrow* reveals a series of relationships well worth serious consideration. Zelomek points out that whereas the near-breakdown in American family life following World War I contributed to our readjustment problem then, the relatively stronger present position of the home may this time give us a point of focus for the sound rebuilding of our peacetime social and economic structure. This he attributes largely to the relatively calm and objective fashion in which we have approached the present conflict in contrast to our great illusions and disillusionment during and after World War I. Here, as in his discussion of the importance of timing in connection with reconversion, the author successfully blends economic and psychological considerations.

Chapters eight, nine, and ten present realistic discussions of the postwar fate of the aircraft industry and air transportation, problems of postwar foreign trade, and



a summary of the postwar economic ambitions of the great and near-great nations of the world. Rarely has so much been said in so few pages.

Chapter eleven finds the author throwing caution to the winds and casting "economic horoscopes" for specific groups within the economy. Prospects for the next decade are discussed for servicemen, businessmen, workingmen, farmers, home owners, professional people, and women.

Of the general business future, Zelomek believes we will have a decade of prosperity. His final paragraph gives us a solemn challenge to meet the problems of the future squarely, . . . "we are offered a second chance. Is it reasonable to expect a third?"

*Here Comes Tomorrow* is a provocative book designed to crystallize thought upon the important issues of our time.

WENDELL R. SMITH

University of Iowa  
Iowa City, Iowa

*The Economics of Peace.* Kenneth E. Boulding. (New York: Prentice-Hall, Inc., 1945. Pp. ix, 278. \$3.75.)

In this book Boulding approaches one of the most perplexing problems in the field of education, that of the "intellectual middleman" for the dissemination of economic ideas. The book is interestingly written and meets many controversial issues without the usual academic side-stepping.

*The Economics of Peace* is divided into two parts, the first treating the economics of reconstruction, while the second and larger part is devoted to the economics of reform. The first part provides a rapid survey of the physical and financial problems of reconstruction, a short case study of Europe from 1918 to 1928, and a chapter on the prospects for the future.

Boulding's approach to the problems of reconstruction is cast largely in terms of physical reconstruction; he points to the necessity of providing something more than "relief" for the devastated areas of the world and suggests that whenever possible direct aid should be supplemented by other forms of aid which will raise the production potential of the needy nations. Thus shipments abroad should include substantial quantities of such things as fertilizers, livestock feed, agricultural machinery and equipment, and the like. It is recognized, however, that such items can not form the sole shipments in the early stages of the relief program, but can be effective only after initial shipments of foodstuffs and clothing have been made. In all, he estimates the need for relief in Europe will not end with the first postwar year, but will continue for five or six years. During this period Boulding believes the Axis nations must be led (and welcomed) back into the fold of "polite society," saying that:

"The only logical solution to the problem (of what to do with Germany and Japan) is that of reconciliation—that is, the attraction of these countries into a world system of responsible government. If this is to be done, the problem of reconstruction must be looked at from a world point of view, not from the point of view of any particular nation. . . . The accidental friendships and

enmities of the destructive monsters that we call 'nations' may be important in their own right to the nationalist; but the scientist must be a servant of truth rather than of his nation, and as truth respects no political boundaries, neither must he" (p. 68).

The more important second part called "the economics of reform" is concerned with such topics as "economic progress," "justice in distribution," "unemployment," "international trade," "doctrinaire illusions," and, finally, a chapter entitled "An Appendix on Politics and Morals." This last chapter is a catch-all for the author's comments on miscellaneous topics, a few of which are rather penetrating.

Boulding's treatment of unemployment will probably attract the most attention and comment. His presentation of the economic aspects of this problem is clear and forthright, and exhibits a skillful blending of Hansen's long-term analysis and the circular-flow approach to economic activity. The necessity of sustaining purchasing power to keep this circular flow on an even keel is recognized as the inescapable duty of the Federal government, the only agency sufficiently powerful to protect society from alternate periods of inflation and deflation. But at this point Boulding parts company with the Keynes-Hansen entente. His solution is not one of public works projects to prevent or alleviate unemployment. Rather he argues for a refurbished compensatory tax plan: high taxes to drain off purchasing power during periods of sharply rising prices and low taxes ("negative taxes"—personal cash subsidies—if necessary) during periods of falling prices. A bi-monthly or quarterly-collected personal income tax is the mainstay of this plan. It should be noted that this solution is logically impeccable if one accepts his identity of public works projects and "boondoggling," i.e., uneconomic use of resources. (True, he recognizes the necessity of non-pricing-system governmental activity but believes such activity should be undertaken purely on its own merits aside from the attempt to prevent unemployment.)

What would appear to be one of the most serious flaws of the tax plan—negative taxation—is dismissed rather hastily. He argues that if the plan is put into use the need for "negative taxation" will be largely obviated because "if people *knew* that deflation or inflation would both be prevented, they would not expect deflations and inflations, and as we have seen, it is the expectation of price and income movements which is the main factor in causing them" (p. 165). One can agree that "confidence" plays a large part in the downward swing of prices during a recession period, but few would be willing to assign it the overwhelming importance which Boulding does. Certainly business cycle theory has more to offer in explanation of cyclical disturbance than the caprice of individual expectations. To the extent that such expectations are reflections of a realistic appraisal of underlying economic maladjustment, any plan which seeks merely to augment purchasing power simply provides an overlay of camouflage. In addition it is to be questioned whether the prospect of cash subsidies during a depression would provide a sufficient bulwark to confidence, and whether the problem of equity in their distribution, administration, and adjustment might not



be greater than Boulding anticipates. Under some conditions public works would appear to be a more attractive alternative.

On the whole, however, Mr. Boulding should be commended. His book deals with topics of real importance in an interesting and nontechnical fashion; it is more nearly a handbook than a text. As supplementary reading in economic courses it should stimulate students in topics too often deadened by the usual textbook approach.

L. G. HINES

University of Minnesota

*Sound Policies for Bank Management*, Robert G. Rodkey (New York: The Ronald Press Company, 1944. Pp. xiv, 224. \$4.00.)

In this book Professor Rodkey discusses the way in which a practical banker might approach the solution of four problems which will be of dominant importance to bankers in the postwar period. The first two problems involve the maintenance of liquidity and long-run solvency. Specifically, how should a banker, in this era of low interest rates, reconcile the conflict between profitability on the one hand and liquidity and long-run solvency on the other? To illustrate the way in which an optimum distribution of earning assets with respect to both quality and maturity might be obtained, Professor Rodkey presents a series of financial statements showing the adjustments that might profitably be made in the earning assets of an hypothetical bank.

Of particular interest to accountants are the last two sections, the first of which deals with public relations and the second with relations between a bank's management and its board of directors. In the section on public relations Professor Rodkey devotes thirty pages to a discussion of the financial statements of banks. In general, it is Professor Rodkey's position that bank statements should provide depositors with enough information to permit an appraisal of the liquidity and long-run solvency of a bank. Finally, in the last section, the author discusses the way in which "the fundamental ability and sound judgment of the board of directors can be brought to bear to the best advantage on these problems and thus to insure that the decisions shall be sound."

Despite its subtitle, "A Discussion for Bank Officers and Directors," the reviewer suspects that this book could be used quite effectively as a text in a course in bank management. The author's style is clear and concise and his practice of developing arguments in terms of practical examples is commendable.

In the sections dealing with liquidity and solvency, it is unfortunate in the reviewer's opinion that more attention was not paid to the effects on postwar banking problems of wartime changes in the liquidity of the economy. The large growth in bank holdings of government securities coupled with the large increase in currency in circulation would, no doubt, serve to limit the shrinkage in bank deposits in the event of a postwar depression. In fact, it may be argued that, given the wartime structure of bank assets, a depression would increase rather than decrease total bank deposits! More attention might also have been paid to the possibilities

of borrowing from the Federal Reserve Banks as a means of meeting short-term drains of funds.

E. T. WEILER

Ohio Wesleyan University

*Regression Analysis of Production Costs and Factory Operations*. Philip Lyle. (London: Oliver & Boyd, Ltd., 1944. Pp. xii, 208. 15/—.)

This volume is intended primarily for the practical industrialist who may be interested in a statistical analysis of production costs. The presentation is on an elementary level with little emphasis on the mathematical or logical content of the formulae employed. This is perhaps as it should be, although the dangers of enthusiastic but ill-considered use of handbook procedures are great. Mr. Lyle gives evidence that he is aware of most of them.

The object of the statistical cost analysis is to determine how total costs change with changes in output, other things being equal. This necessarily imposes important restrictions on the length of the period over which the data are collected. Given a satisfactorily defined sample of observations representing associated output (assumed free of error) and total costs, say for weekly periods, a short-period statistical cost function is easily determined by standard regression analysis. The regression function may be of any elementary form: the author regards a linear function, or at most a quadratic function, as sufficient when a single homogeneous commodity is involved. If more than one product is manufactured, and different costs are involved, multiple regression analysis is required. The statistical significance of the mean value, the coefficient of correlation, the regression constants, and the individual regression values of costs must be determined. The author quite properly bases his reliability tests on the well-known small-sample theory of R. A. Fisher. The general expression for the required fiducial limits is given by  $E \pm t\sqrt{V(E)}$  where  $E$  is any of the statistics to be tested and  $V(E)$  is the corresponding variance. The author chooses a significance level of 0.95, and the required value of  $t$  for this (or any other) level is found from the tables of  $t$  when entered with the appropriate degrees of freedom.

If the general linear function  $Y = a + bx$  is fitted to the data by least squares, then the constant  $a$  represents the total fixed costs (the estimated costs when output is zero) and  $b$  is the marginal cost. Since  $b$  is a constant, a linear cost function represents marginal costs as constant over the range of output for which the regression is valid. The mean coordinate  $(\bar{x}, \bar{y})$ , which lies on the regression line, may be regarded as the planned production for the period covered by the short-term analysis, and actual output fluctuates about this level. If the planned production level is changed, output fluctuations take place about a new level and a new regression line is made necessary by the fact that a new classification of costs between fixed and variable has been imposed by the mere lapse of time. This question will be reconsidered below. The locus of the mean coordinates  $(\bar{x}, \bar{y})$  for the short-period cost functions is termed the long-run cost function. For a full specification of the latter func-

tion it is necessary to express the overhead cost and the fixed factory cost—the two components of the total fixed cost—as functions of the planned production level. This can be accomplished by graduating the estimates of these costs for different production levels; that is, the cost accountant must guess at the classification between fixed and variable plant elements for each production target. It follows that the time interval allowed must be just sufficient for this classification to be realized as an average. If now it is assumed that the slope of some specific short-period cost function can be taken as a parameter, a long-period function relating changes in planned production and total costs can be derived. The relevant cost elements must, of course, be corrected for changes in their prices.

What do these cost functions mean? Undoubtedly the short-run cost function will provide the cost accountant with useful predictions of total costs for different outputs. The accuracy of these predictions will depend on the goodness of fit of the regression function. The use of the regression coefficient as an estimate of marginal cost requires high correlation. The usefulness of the long-period cost function is limited to output changes which occur essentially within the same plant—in the broader sense. This follows from the assumption that the mean coordinates, the locus of which defines the long-term function, all lie on short-term regression lines having the same slope.

Perhaps of greater importance to the economist is the reconciliation of these statistical functions with those customarily assumed by economists. It should not be surprising that the author, along with Joel Dean and others, should have found linear regression functions, and hence constant marginal costs, within their applications. Statistical cost functions must generally be based on output changes with relatively short periods, e.g., one year, and it is then likely that the range of variation in output to which the empirical function applies is appreciably less than the maximum range possible. There is no reason why the production plan should not be designed to provide fairly complete adaptability of the fixed productive services in the short run. This would insure constant marginal costs over a considerable range of output, the costs increasing very sharply when designed capacity is reached, if indeed output can be increased at all. (See the article by George J. Stigler,

"Production and Distribution in the Short Run," *Journal of Political Economy*, XLVII (1939), 305-327.) With incomplete adaptability in the short run it may be possible to achieve constant marginal costs over narrow ranges of output, these ranges being discontinuous. Other possibilities are readily constructed.

One other essential fact must be taken into account in the comparison. The distinction between fixed and variable costs cannot be finely drawn—the elements of plant costs will be fixed for an array of periods. The economist's short-run cost function is therefore drawn on the assumption of a specific classification of the costs involved, and the passage of time which would change the classification is explicitly ruled out. The costs which are "fixed"—the numerical value of the constant  $a$ —in the short-period statistical cost function are therefore those costs which are fixed on the average over the entire period to which the analysis applies. Any change in the length of the period must therefore involve a different set of costs held fixed on the average.

There is little correspondence between the long-period statistical cost function and the theoretical function. The main reason lies in the fact, previously noted, that it cannot be assumed that the marginal costs will remain constant as the short-term mean outputs vary. There are other reasons, of course, but they need not be labored here.

Mr. Lyle's book should prove useful to cost accountants and plant managers, and economists will welcome the additional evidence on the form of empirical cost functions. An analysis of this type appears to be limited, at least in its present state of development, to cases in which one homogeneous product, or a relatively small number of them, is involved in the manufacturing process. This limitation will also help to explain the generally linear regressions found in the studies made to this time. There is relatively little in the book to quarrel with. The meaning of marginal cost for a quadratic cost function is misinterpreted, as is also the meaning of the partial coefficients of regression for a multiple analysis. The author's excursions, in the concluding chapter, into economic miscellanea are regrettable. The long appendix covering various aspects of the technique will be found useful by the beginner.

M. P. STOLTZ

Brown University

Important announcement inside back cover.

# ASSOCIATION REPORTS

## EDUCATION COMMITTEES

THE AMERICAN INSTITUTE OF ACCOUNTANTS  
AND THE AMERICAN ACCOUNTING ASSOCIATION

*Report of a Joint Meeting, June 22 and 23,  
1945*

A joint meeting of the Committees on Education of the American Institute of Accountants and the American Accounting Association was held in Chicago on June 22 and 23, 1945, at the Palmer House. There were present: Messrs. Henry T. Chamberlain of Loyola University, Ernest A. Heilman of the University of Minnesota, William A. Paton of the University of Michigan, Hiram T. Scovill of the University of Illinois, and Sidney G. Winter of the University of Iowa, all of the American Accounting Association Committee; and J. W. Queenan, A. W. Torbet, and Raymond G. Ankers (representing C. H. Knoll), all of the Institute Committee. Also present were Thomas W. Leland, Educational Director of the Institute, Kenneth M. Montgomery and William C. Wagner, representing the Institute, and Ernest Davies of Northwestern University, F. H. Elwell of the University of Wisconsin, and Harvey G. Meyer of the University of Tennessee, President of the American Accounting Association.

The purpose of the meeting was stated to be to lay the groundwork for permanent cooperation in the education field by the two organizations, to discuss common problems, and to appoint subcommittees to work out possible solutions. The meeting was then devoted to a discussion of the following subjects on the agenda.

## Curricula

The discussion on the subject of college curricula developed the following thoughts.

- (1) A student majoring in accounting should be trained with the thought that he may eventually become a principal or partner of a professional accounting firm or a comptroller of an industrial organization rather than for the performance of the more routine auditing or accounting functions.
- (2) It is impracticable to separate the training for public accounting from that for industrial accounting during the undergraduate period; special training for public accounting can be practical only in graduate work or in special elective courses during the senior year.
- (3) In general, college training in accounting principles is satisfactory except that possibly there is need for more collateral reading to broaden the students' concepts of principles.
- (4) The principal weakness in technical training is in the field of auditing.
- (5) In addition to the usual commercial law courses, there appears to be a need for training in the fundamental law of evidence as it relates to accounts and records, and the relationship of evidence and auditing should be stressed in the study of auditing.
- (6) In addition to the technical subjects more attention should be given to English—the ability to write and speak correctly and fluently—and to training in public speaking.
- (7) College students are particularly deficient in ability to read clearly and precisely—they frequently do not have a clear or exact understanding of what they have read.

In discussing the need for more collateral reading it was recognized that colleges are often handicapped by the time factor in covering many courses within the time available and, consequently, must attempt to stimulate interest to the extent that students will voluntarily do outside reading. Many of the colleges furnish students with lists of books and publications for outside reading. However, the response to

that opportunity has not been great. It was the consensus that colleges must continually strive to develop men with inquiring minds and that courses should be conducted with the question of possible alternatives always before the students.

At the conclusion of the discussion a subcommittee was appointed, consisting of Mr. Heilman, Chairman, and Mr. Queenan, to consider the question of the preparation of a bibliography for collateral reading.

There was general agreement that training in auditing should be improved, but that the possibility for improvement was limited by the unavailability of instructions, manuals, and questionnaires used by public accounting firms and of records and documents used in ordinary commercial operations, which would give the students the opportunity to become familiar with the detail usually encountered in business and to learn to organize a volume of work. It was the sentiment of the practicing accountants present that auditing courses should emphasize what can be considered as satisfactory evidence of the reliability of accounts in reflecting transactions, and that if the colleges will teach the fundamental principles of auditing the various firms will, and can readily, teach the form or manner of application followed by the respective firms.

A subcommittee, consisting of Mr. Ankers, Chairman, and Messrs. Winter, Torbet, and Davies, was appointed to investigate the possibility of making available practical data for auditing instruction.

There was general agreement that it is important and necessary that accounting students become thoroughly grounded in the use of English; that most colleges had made considerable progress in this respect in the past ten years; but that improvement in such training should be possible. Many schools require special courses in report writing and certain schools review

accounting papers as to use of English. The suggestion was made that schools might require students to submit more of their accounting work in commentary form rather than in purely statement or problem form and that the work might be graded on the basis of English as well as accounting.

There was little or no disagreement with the statement that most students are deficient in their ability to read clearly and precisely, and that as a result, in their period of service as junior accountants, they are apt to overlook completely important provisions in documents examined by them. It was the opinion of the educators that the college is not the place to correct the deficiency, since the responsibility rests with the secondary and grade schools. To a considerable extent this deficiency appears to be the result of the influence of so-called "modern education" in which speed is regarded as more important than accuracy in reading. Colleges may correct this tendency in students by requiring a very intensive course in reading and written expression.

It was the consensus of the meeting that college training in accounting principles is generally satisfactory and that most deficiencies in education are in other fields of study. Most of the collateral courses, such as English, Economics, and Law are not, and under present organizations cannot be, taught with a view to preparing students for the field of accounting, as are the courses provided in the curricula in schools of law and medicine. This situation will not be corrected until accounting achieves the wide public recognition of the older professions. At present many students who eventually major in accounting do not enter college with that intention but drift into the field at various stages in their college education.

It was the opinion of the meeting that it was impracticable to attempt to prescribe a uniform curriculum for all colleges, but



that a minimum program is desirable and feasible.

Inasmuch as the American Accounting Association has appointed a committee to study and recommend minimum requirements for an accounting major, it was suggested that that committee be requested to refer its findings to the joint committee on education before publishing its recommendations.

#### SPECIAL TRAINING FOR RETURNING WAR VETERANS

In the discussion of special training for returning war veterans it was pointed out that at least 4,000,000 men and women in service are presently qualified for college-level courses and that a study of postwar plans of service men indicates that accounting ranks high in the expressed preference of veterans as to a choice of subject matter. It is logical to conclude that there will be a greater-than-average increase in enrollment in full-time accounting courses, considerably more than will be the case in the liberal arts courses. The task of absorbing these veterans in our schools of accounting and in accounting jobs will be of far greater magnitude than was the case after World War I. However, it is expected that the demand for trained accountants will exceed the supply which will be available in the next five years.

One of the principal problems which will arise will be in the matter of counseling veterans as to the opportunities and requirements of the accounting profession and as to their apparent qualifications and fitness for success in that profession. The Army separation centers have made available counseling services to assist the veterans in choosing their future careers. However, it should be evident that such counseling can be only superficial as to the accounting profession and other specialized occupations.

Various colleges have made available

counseling services through committees which handle such matters as financial arrangements, medical services, psychiatric service, housing, recreational activities, employment, and general help in selecting fields of study. Here again, the counseling as to choice of occupations appears to be very general and in most cases does not provide for close review of the possibilities of the accounting profession by individuals who are qualified to advise in that connection.

The principal need appears to be for literature explaining the opportunities and requirements of the accounting profession which will be available to the veterans to assist them in appraising their abilities, qualifications, and personal characteristics in order to evaluate their possibilities of success and enjoyment in the accounting profession. There was unanimous agreement that there is a real need for the pamphlets on the accounting profession that are under consideration by the joint committees.

As to the question of special training for returning war veterans, the educators indicated that the vast majority of veterans have asked not to be placed in separate classes.

Returning veterans interested in accounting generally will fall into two groups: (1) those who have already completed an accounting education, (2) those who have not entered or completed their college training in accounting. As to the first group, the principal problem is that of refreshing their accounting knowledge and bringing them up to date on developments. It is the opinion of the joint committee that the publication *Contemporary Accounting*, to be brought out by the American Institute of Accountants, should be very effective in preparing these veterans for a return to accounting occupations.

As to the second group, the principal problem, in addition to making available



to them information which will enable them to reach a decision on their future career, is that faced by the colleges in providing courses which will permit veterans to complete their education in the shortest possible time consistent with an adequate education. The committee was of the opinion that it would be difficult to make plans at the present time for the organization of special classes in the nature of refresher courses. Since the veterans will be scattered widely and, for the present at least, will return at various intervals of time, it is doubtful that classes organized exclusively for veterans can be established except in very large cities, such as New York and Chicago.

#### THE QUARTER SYSTEM AND APPRENTICESHIP TRAINING

Of the colleges represented at the meeting, the University of Minnesota was the only one operating on a quarter system and providing an organized apprenticeship schedule for students during one or more of the quarters (usually the winter quarter) in the junior and senior year. Experience with the program has been very satisfactory and has demonstrated many advantages to the student and the University. Shortly after the University adopted the plan, more and better students enrolled in the accounting curricula. The program gives the student his first actual contact with documentary evidence and a knowledge of the nature of public accounting without any obligation to continue in the profession. It has been of help to students in deciding what career they wish to follow, and it has helped in placing them upon graduation. Practical experience in public accounting contributes to the development of their personality and demeanor and in most cases motivates further academic work because of a better understanding of the applicability of accounting theory and related subjects. There are also many ad-

vantages to the public accounting firms. Such a program provides accounting firms with additional assistance during the busy period and makes the various firms known to the students. Firms have the opportunity of appraising the students' abilities and possibilities and thereby improve their chances of obtaining better men. Moreover by contributing to the training of students in a way which is conducive to students' obtaining more from their class work, public accounting firms should benefit by having available for employment upon graduation better-trained accounting students.

The opinion of educators and practicing accountants was that practical experience during the course of college education contributed very effectively to a student's education. However, certain educators were of the opinion that students might gain more by working for public accounting firms during the summer quarter than during the winter quarter, inasmuch as the firms would have more time to devote to their training and could even provide special training courses for them. The practicing accountants were of the opinion that the winter quarter was preferable not only because it is the time when students can be of most assistance, but also because the intensive work of the busy season will provide the students with more actual practical experience than could be obtained in a special training course. The practicing accountants indicated that because of the evident benefits of practical experience during college, certain firms might be willing to take a limited number of students for special training during the summer if it were undesirable for the students to be away from classes during the winter quarter.

The educators pointed out that it was almost impossible for colleges on a semester basis to permit students to leave school for practical experience at any time other than during the summer. Even

if students are willing to leave school for the second semester, many practical difficulties are involved since they might have to wait until a year later to take certain courses given only in the second semester.

This subject is apparently of such importance as to warrant further study and consideration by educators and practicing accountants.

#### STAFF EDUCATION AS DISTINCT FROM PREPARATORY EDUCATION

Programs used by various firms in staff education were discussed. Because of the fact that the greatest weakness in formal education appears to be in auditing, a considerable portion of the training programs of most firms is in that field—studying working-paper preparation and auditing programs and procedures, referring to actual working papers or working solutions to practical auditing problems, and listening to lectures on auditing by staff accountants. In addition to auditing instruction, the training programs include instruction in report writing, in firm policies and procedures, and in some cases experience in public speaking. There was a feeling among the educators that it would be very beneficial from their viewpoint if various accounting instructors, particularly the younger ones, were permitted to attend certain of the staff training programs as a means of determining in what manner college instruction could be improved. There was the feeling that ultimately it should be unnecessary for staff training programs to include anything other than individual firm policies and procedures.

#### INFORMATION AVAILABLE TO STUDENTS AS TO THE PUBLIC ACCOUNTING PROFESSION

The proposed revision of the pamphlet *Accountancy as a Career for Educated Men* was reviewed and suggestions were made for improvement. It was felt that the pam-

phlet should be the first step in providing vocational information relating to public accounting and should be followed by other pamphlets explaining in more detail the nature of the work, the opportunities, and the qualifications needed in the profession. It is evident that the public accounting profession must furnish material to high schools as well as colleges, which will be available to students when considering a choice of vocations. It was the consensus of the meeting that many outstanding young men who might be very successful practicing accountants choose other professions only because they are better known. The public accounting profession has consistently undersold its opportunities. Although the joint committee does not advocate flamboyant advertising of the profession, it does advocate an energetic campaign to acquaint students with the profession and a realistic picture of its opportunities. Such a program would not only recruit desirable students, but should also result in a better public understanding of the profession. A suggestion was made that the American Institute furnish copies of the *Journal of Accountancy* to the libraries of high schools throughout the country, as one step in familiarizing faculty and students with the profession. It was also suggested that members of the profession should arrange to talk to high school teachers at state teachers' meetings.

Consideration was given to the desirability and feasibility of preparing an *official* list of colleges for recommendation to students who are planning to enter the accounting profession. The joint committee concluded that such a list was desirable, but because of the absence of standards for judgment, the project is not presently feasible. The joint committee recommended the preparation of an *unofficial* list of acceptable schools, which after a period of time and with more complete information, might form the basis for setting standards

and the preparation of an official list to be published jointly by the American Institute of Accountants and the American Accounting Association.

A joint committee, consisting of H. T. Scovill, Chairman, and Messrs. Paton, Ellwell, Montgomery, and Leland, was appointed to consider the compilation of a file of acceptable colleges, and to draft a pamphlet to be issued as a supplement to *Accounting as a Career*. This pamphlet would set forth a more complete description of the accounting profession.

The opinion was unanimous that the meeting, with its frank discussion, had contributed considerably to cooperation between the professional accountants and the educators, and should serve as a basis for effective cooperation for many years.

HENRY T. CHAMBERLAIN, Chairman  
American Accounting Association

JOHN W. QUEENAN, Chairman  
American Institute of Accountants

#### EXECUTIVE COMMITTEE

#### ABSTRACT OF THE MINUTES OF MAY 19 AND 20, 1945

The meeting was called to order by President Meyer at 10:30 A.M., May 19, 1945, in Parlor L of the Netherland Plaza Hotel, Cincinnati, Ohio, with the following members present: Blough, Carmichael, Davies, Dixon, Meyer, and Seidman. With the exception of recesses for eating and sleeping the meeting remained in session until 12:30 P.M. May 20.

The work of the committee on education, cooperating with a similar committee of the American Institute of Accountants, was discussed in some detail. Blough stated that it had been agreed upon by the Association and the Institute that the Association committee was to be composed entirely of teachers and the Institute Committee made up entirely of practitioners. The President reported that the members of the Association committee were as follows,

H. T. Chamberlain, Chairman: E. A. Heilman, A. N. Lorig, A. A. MacFarland, W. A. Paton, H. T. Scovill and S. G. Winter. So that there might be no misunderstanding it was resolved that

The President be authorized to advise the members of the committee that their expenses to a meeting of the joint committee would be paid by the Association.

The Secretary stated that he had received a request from a correspondence school that the student membership privilege of \$1.00 per year subscription to the REVIEW be extended to correspondence students. After discussion it was resolved that

If the Secretary-Treasurer finds that the cost of printing and mailing additional copies of the REVIEW does not exceed \$1.00 per year per person, the student membership privilege be extended to extension and correspondence students.

Some discussion then followed in connection with the question of furnishing free copies of a monograph to the author. No formal action was taken but it appeared to be the consensus that

If the author of a monograph had waived his royalties he should be furnished as many copies (within reason) as he desired, but if he was to receive royalties he should be furnished only as many copies as a commercial publisher would supply.

The President brought up the subject of an annual convention for 1945 and stated that there seemed to be two alternatives open to the committee: to begin laying the groundwork for a convention to be held if the restrictions are lifted, or definitely to put aside all thought of a convention and plan on some other method of procedure. He referred to a communication from Littleton calling attention to the serious need for satisfactory papers for the ACCOUNTING REVIEW and pointing out that a convention in September was the source of good articles for the October and January issues. Littleton apparently assumed that a con-

vention was out of the question and that some other method should be devised to secure papers, suggesting a plan whereby ten speakers would be asked to prepare papers, with a September 1 deadline, for a "stay at home" convention.

In the discussion which followed the possibilities of the restrictions being lifted and the extent to which they might be changed by September were thoroughly canvassed. Most of the members seemed to feel somewhat doubtful whether any meetings could be held, but that so long as there was any possibility, the committee should go ahead with the plans for one and make up the program, including the subjects and speakers. To make this of formal record it was resolved that

A convention of the American Accounting Association be scheduled for September 6 and 7, 1945 in Chicago and that the necessary arrangements be made for program, speakers, etc.

Dixon proposed that the Committee consider the possibility of bringing out a publication on "Cost Accounting Principles." This led to a discussion of the relationship of the Association with the National Association of Cost Accountants and whether such a study should be conducted by one or the other of these Associations or be made a cooperative project. It was resolved that

A Committee on Cost Accounting be appointed to explore the possibilities of developing a "Tentative Statement of Principles Underlying Cost Accounting," the size of the committee to be left to the President.

A budget for 1945, prepared by Carmichael, was presented. After discussion it was resolved that

The budget be approved in total, with the understanding that shifts within the items might be made.

The President announced that N. D. Durst had agreed to act as chairman of the membership committee to conduct the

membership campaign of 1945. No formal action was taken in connection with the membership campaign, but the suggestion was made that the publisher be asked to run off two copies of the mailing list of members for the use of the chairman.

The question of cooperation with the American Institute was then brought up, particularly whether or not there should be an Association committee to work with the Institute committee on accounting procedure in formulating releases by this committee. The question was raised as to whether it was feasible to send these bulletins in prefinal form to the Association, the NACA and the Controllers Institute for comment. It was the general opinion that the Institute should follow a policy of not releasing bulletins unless they had been presented to the representatives of these organizations to get their ideas. It also seemed to be the consensus that it would not be practical for the Association to function on a joint committee or be placed in the position of adopting as an Association the principles proposed. There would be special cases in which it would be desirable for the Association committee to cooperate with the Institute committee on accounting procedure; but in general the executive committee would be the committee to discuss the proposals by the Institute committees. It was resolved that

A committee be designated by the President to cooperate with the committee on accounting procedure in connection with the problems involved in preparing a bulletin on the "Purpose of the Income Statement."

Blough passed out copies of the booklet "Form of Regulatory Public Accounting Bill," prepared by the American Institute as a guide to aid state committees on legislation in planning for state bills. In the discussion which followed attention was called to the fact that a college educational requirement was provided for and that the state boards would be faced with the prob-

lem of evaluating and classifying the work of various colleges. The suggestion was made that the Association might be of real service to the Boards in this connection. It was therefore resolved that

A committee be appointed by the President to explore the possibilities of developing a standard curriculum or minimum accounting program that might be used as a gauge for measuring the scope of the work offered by schools applying for recognition.

Dixon commented briefly on the work of the Director of Research and stated that the following items were under consideration as possible subjects for monographs:

1. Asset Valuations (dissertation, Y. C. Chow)
2. A Study of SEC Cases, particularly stop-orders (Pierpont)
3. An Index to the ACCOUNTING REVIEW (from the first issue to date)

It was resolved that

The Director of Research be authorized to bring the index up to date for the purpose of publishing it in book form to be sent free to members and sold to others, price to be determined later.

It was also resolved that

The Director of Research be authorized to have a

monograph committee appointed to serve with him. Committee to be appointed by the President in consultation with the Director.

The subject of the convention in September was again brought up for discussion and particularly the question of what steps the committee should take if the convention had to be called off. No formal action was taken, but it was understood that the committee would meet in Chicago on September 8 and 9. The President was reminded that if it developed that the convention could not be held, a nominating committee would have to be appointed well in advance of the convention date so that balloting could be done by mail.

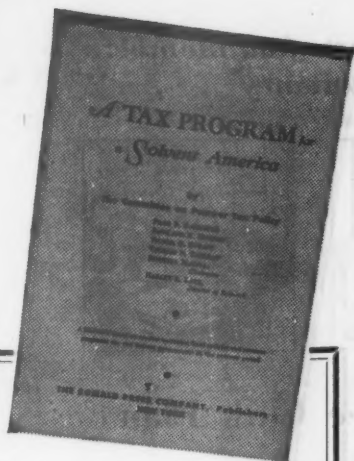
Meyer read a letter from Dean Elwell of Wisconsin asking that the Association undertake the preparation of a concise, complete analysis of the various fields of accounting. After some discussion it was agreed to ask our committee on education to undertake the preparation of such a statement.

The meeting adjourned at 12:30 P.M. May 20, 1945.

**Important announcement inside back cover.**







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## The ASBA Conference Club Plan

The practicability and success of group training of home study students—*under trained leadership*—was recognized by the U. S. Office of Education in Bulletin 1920, No. 10:

“Because it also serves as a means whereby persons at a distance from the institution and the instructor may be efficiently taught, several attempts have been made to conduct classes by the correspondence method. Such attempts have been called by various names. *Group or club study classes* are names commonly applied.

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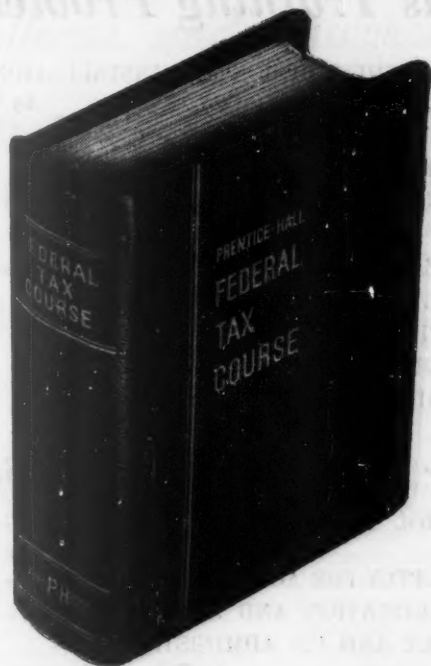
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	Mar.	June	Sept.	Dec.	Index
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1927	X	X	X	O	O
1928	O	O	O	O	X
1929	X	X	X	X	X
1930	O	O	X	O	O
1931	X	X	X	X	O
1932	X	X	X	X	X
1933	X	X	X	X	X
1934	X	X	X	X	X
1935	X	X	X	X	X
1936	O	X	X	X	X
1937	O	X	O	O	O
1938	O	X	X	O	X
1939	O	X	X	X	X
1940	X	X	X	X	X
1941	X	X	X	X	X
	Jan.	Apr.	July	Oct.	Index
1942	X	X	X	O	X
1943	O	X	X	O	X
1944	O	X	O	X	X
1945	O	X	X		

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## *Announcement*

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Immediately after the announcement of the partial lifting of the restrictions on conventions, the Executive Committee gave serious consideration to the possibility of holding a convention this year. The Committee was in agreement that a convention should be held if it was at all possible to do so, but it appeared that the only time at which one could be scheduled would be during the last week in December. It was finally decided that this would be impractical on account of the difficulty in securing hotel accommodations, the probability of transportation difficulties during the holidays, the uncertainty of member attendance, and the hesitancy of many members of the Association to return to a December date for the convention. The Committee therefore voted to make no attempt to hold a convention this year but to make definite plans for one next year in June or September.

There is some difference of opinion as to which would be more desirable, a convention held in June or one in September. The date of the closing of school in June and the opening of school in September in the majority of the schools represented in the Association will influence the choice. You will therefore be given the opportunity to express your preference (June or September) by means of a poll to be conducted by mail within the next few weeks. The teacher members will also be asked to give the dates of the closing of the school year in June, Commencement, and the opening of the school year in September as scheduled by the institutions with which they are connected.

The election of officers for 1946 will be conducted by mail. A nominating committee has been appointed by the President to make nominations for the various offices. As soon as this committee has reported, the ticket so selected will be submitted to the members by means of a mail ballot, and each member will be given the opportunity to vote on this ticket or to make other nominations.

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